January 1955

COPY

architectural FORUM

the magazine of building

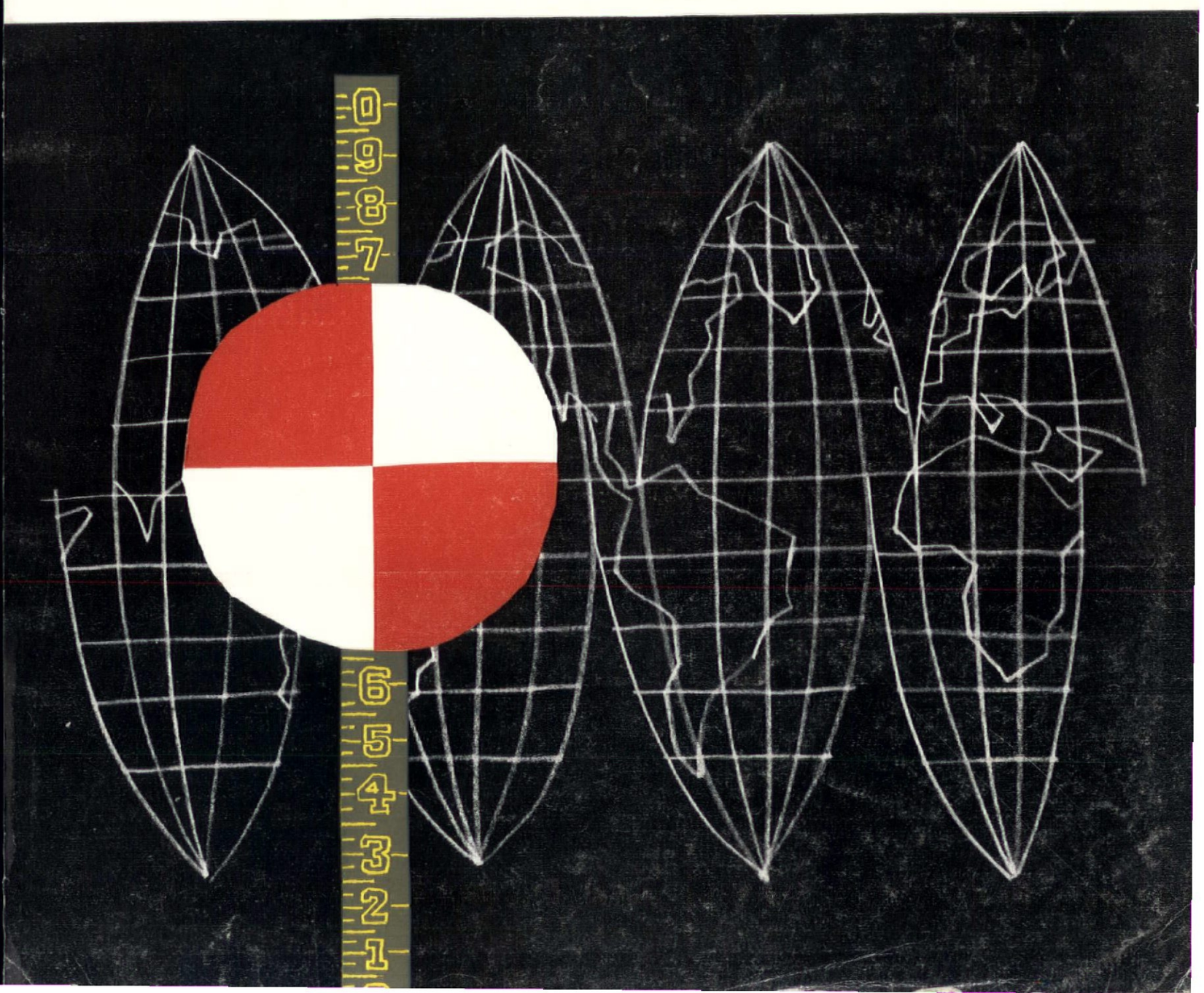
Manhattan's blockbuster A preview of the 42-story Socony-Vacuum building and the story of the people who are shaping it (p. 86)

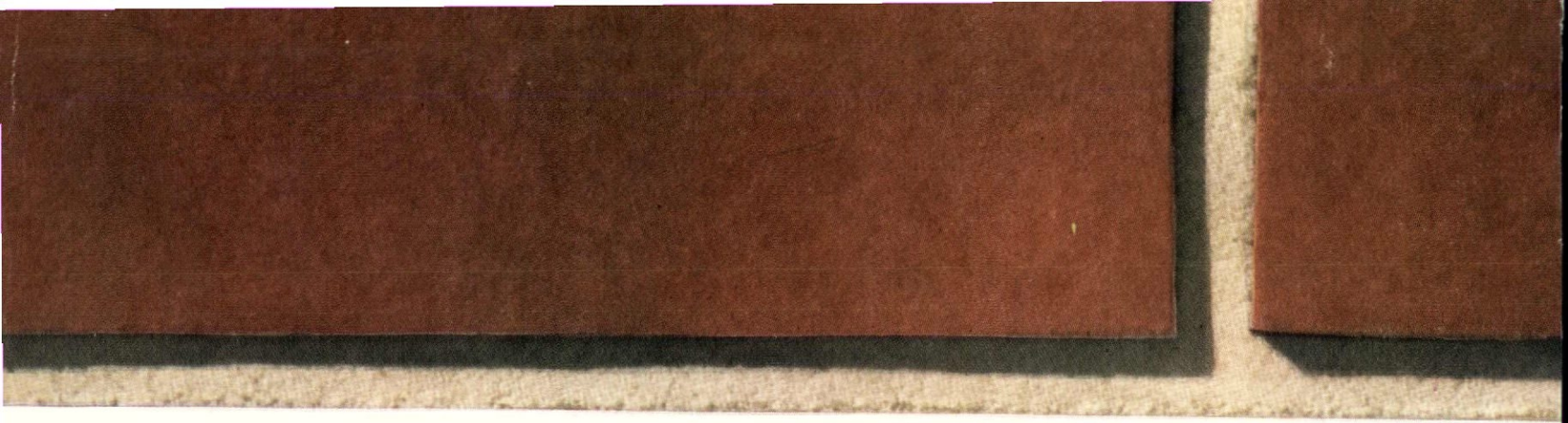
The arcade makes a comeback Chicago uses it to widen congested streets; in New York City Woolworth uses it to connect Macy's and Gimbels (p. 93)

Office of merit An elegant headquarters for the eye of CBS (p. 135)

Plastics A review of their uses in today's building and a forward look at promising new materials, new applications (p. 120)

US building abroad As ambassador to the world, the industry is building everything from radio towers to new towns—including good will (below and p. 98)





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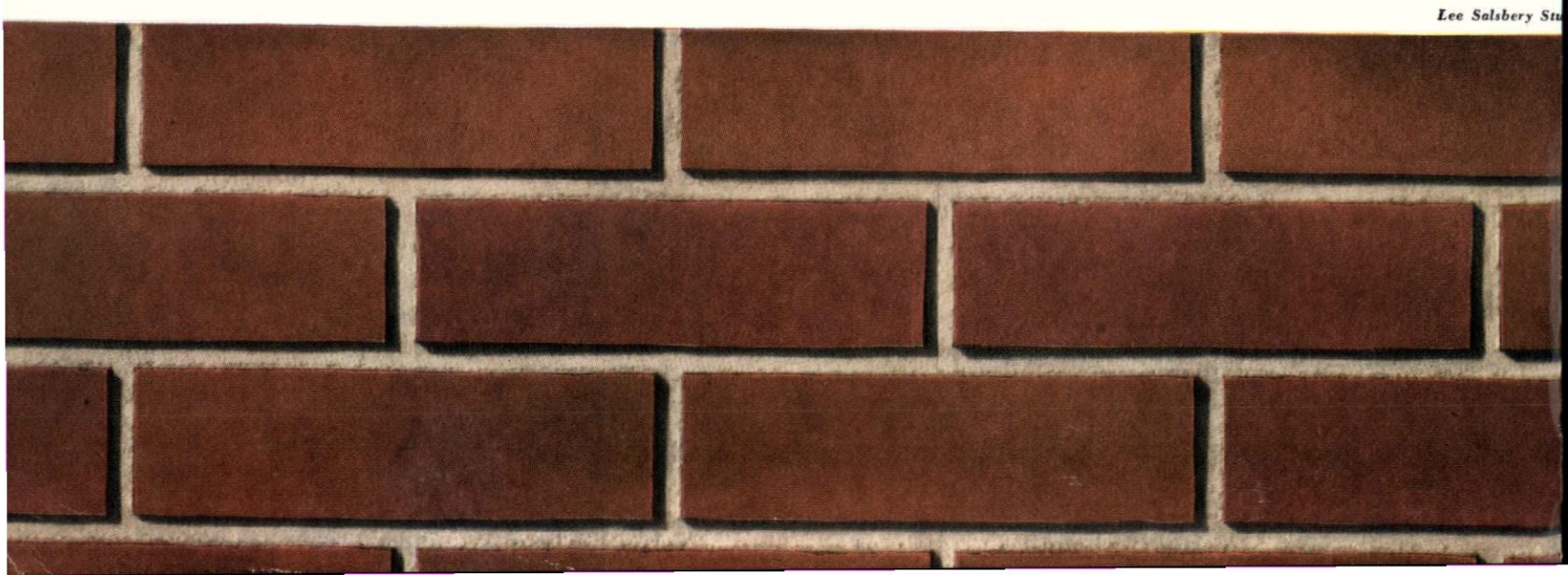

architectural **FORUM**
the magazine of building

JANUARY 1955

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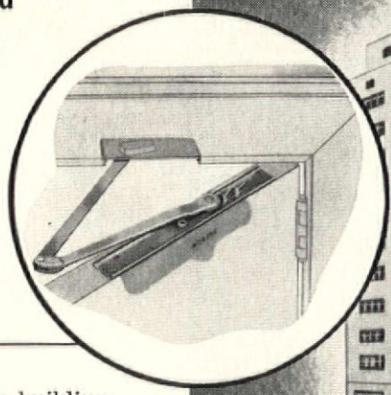

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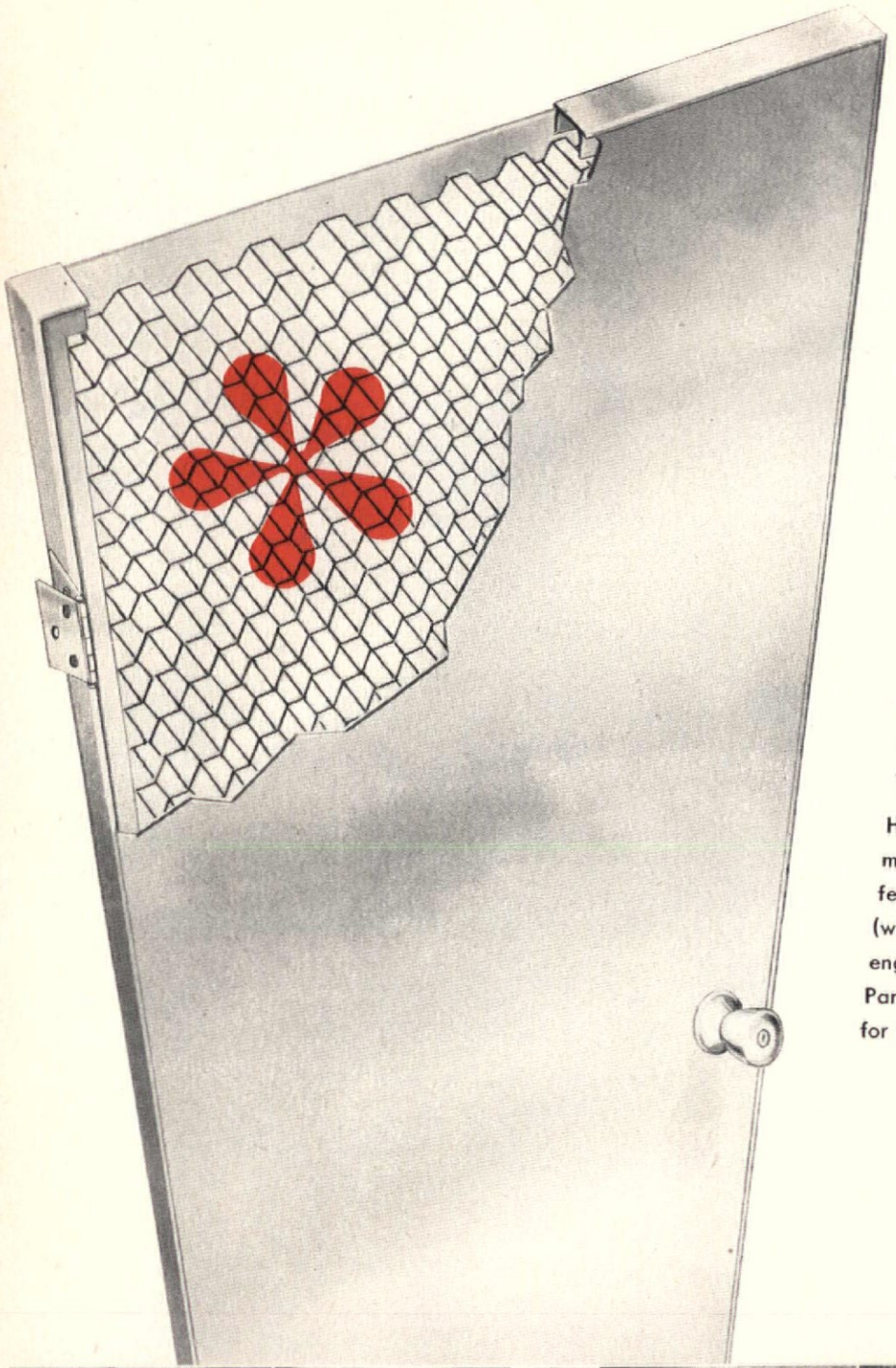

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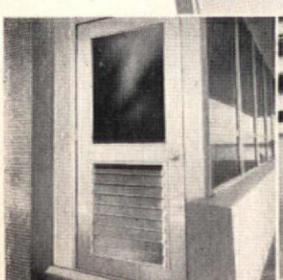
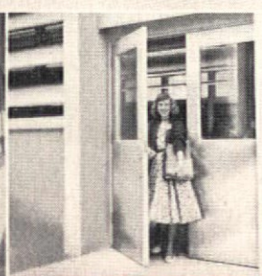
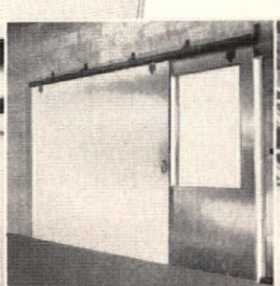


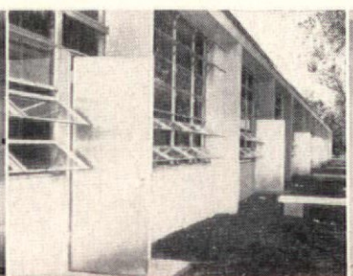
Exterior Jalousie Doors for Fontainebleau Hotel, Miami Beach, Fla. Architect: Morris Lapidus



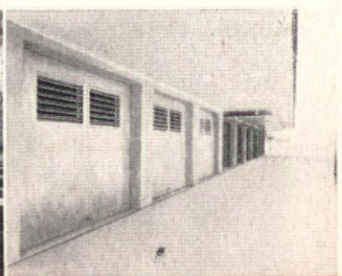
Exterior Panel Doors for Edison Jr. High School, Miami, Fla. Architect: Edwin T. Reeder & Associates



Sliding Doors for Grables Bakeries, Miami, Fla. Architect: Petersen & Shuflin



Flush Exterior Doors for Elementary School, North Miami, Fla. Architect: Wahl Snyder



Tilt Doors for Golden Gate Hotel Miami Beach, Fla. Architect: Polevitsky, Johnson & Associates

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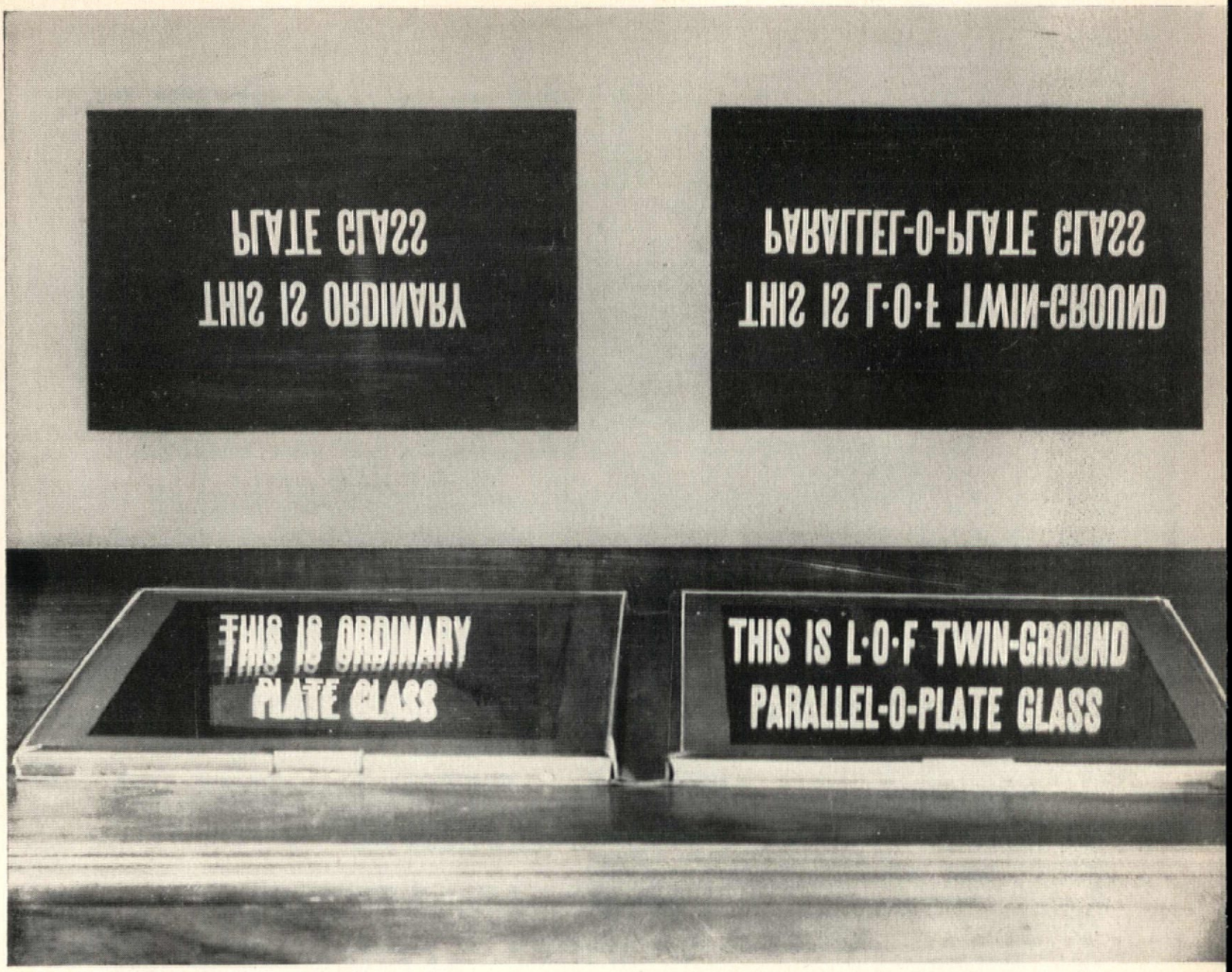
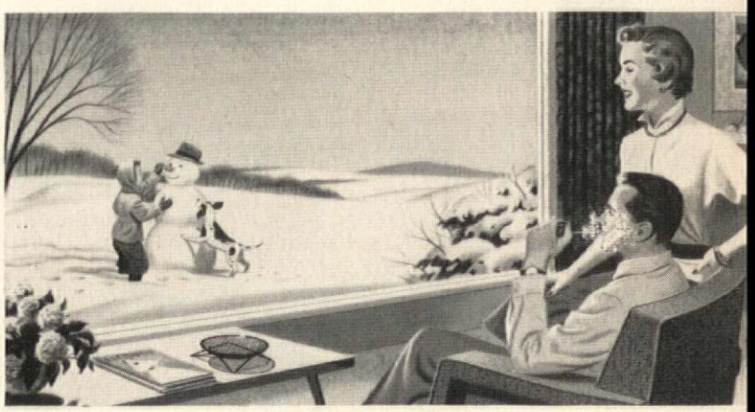
PANELFAB DOORS are formed upon a resin impregnated fibrous honeycomb core extending to the full dimensions of a one-piece extruded aluminum frame. Core and frame are permanently pressure-thermo-bonded and roll-interlocked between aluminum facings. Facings are available smooth or in a variety of embossed patterns —anodized or prepared for painting.



LOOK AT THIS COMPARISON between the reflections of the upside-down signs in the mirror of conventional plate glass (left) and the mirror of Parallel-O-Plate Glass (right). This unretouched photograph dramatically illustrates the principle of parallelism in glass.

LOOKING IN through the Parallel-O-Plate Glass in a storefront, you hardly know the glass is there.



LOOKING OUT of your picture window made of Parallel-O-Plate *Thermopane* you see the scene as it *is*.

Look at the amazing difference between new Libbey·Owens·Ford Parallel-O-Plate Glass and ordinary plate glass

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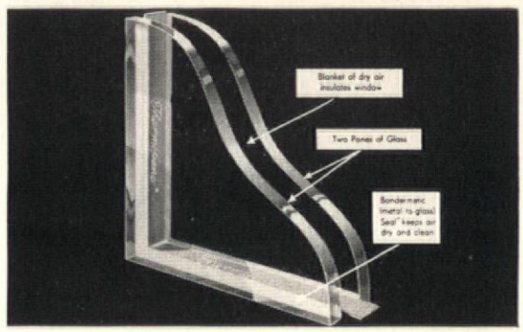
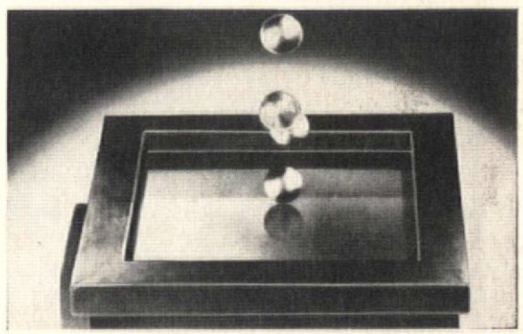


Parallel-O-Plate is doubly important for *Thermopane*® insulating glass because there are two panes to look through.



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Parallel-O-Plate Glass

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LOOKING AT windows of Parallel-O-Plate Glass you see how much its truer reflections mean to exterior appearance.

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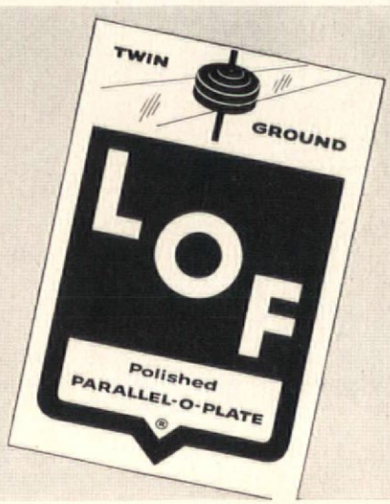

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5	85%	85%	85%
6	83%	77%	80%
7	Yes	Yes	Yes
8	Yes	Yes	Yes
9	Yes	Yes	Yes
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12	Yes	Yes	Yes

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A complete compilation of all new RLM Specifications covering 46 different types and sizes of incandescent and fluorescent industrial lighting units, may be found in the new 1955 RLM Specifications Book.

Included are the names and addresses of RLM participating manufacturers who make one or more lighting units bearing the RLM Label. For your complimentary copy, sent without obligation, please address your request on your company letterhead to:

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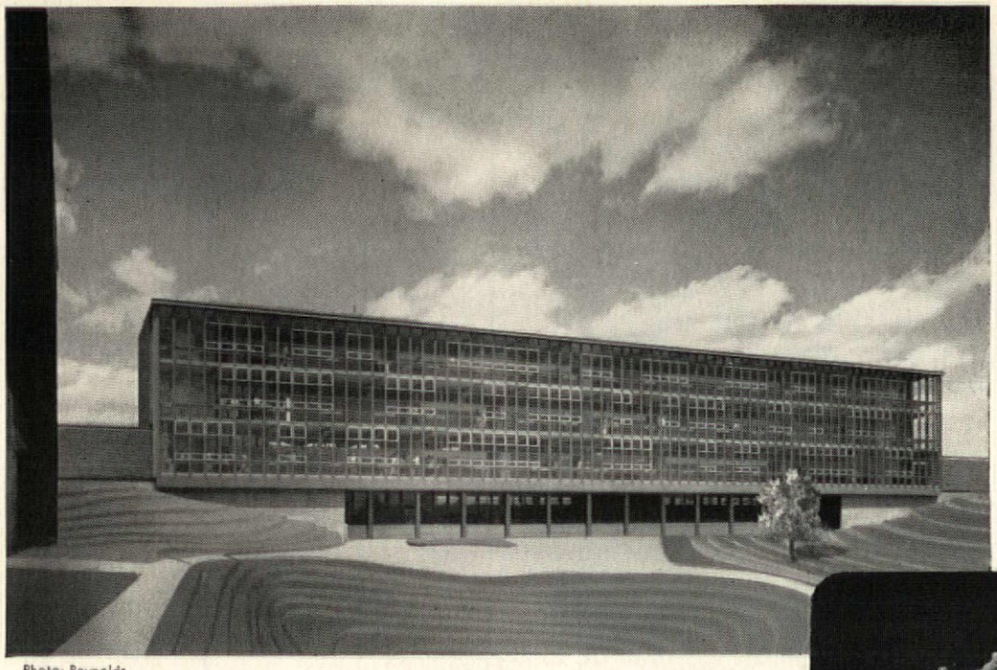

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With additional units to come, the Keokuk, Iowa, High School and Community College is widely proclaimed "America's most modern school." Pictured left to right are: Gym-Field House, Cafeteria, Administration-Music Wing, and Academic Unit.

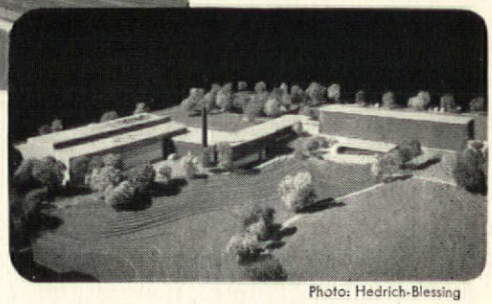
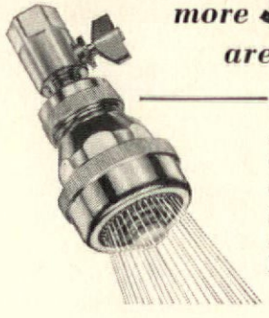


Photo: Hedrich-Blessing

CHEERS FOR "KEOKUK SENIOR HIGH!"

KEOKUK, city in Iowa, named for the Indian chief known as "he who moves alertly."— ENC. BRIT.

• The alertness of Keokuk, the city, is ably demonstrated by its remarkable new high school and community college—a highly successful million and a quarter dollar project combining determination, daring and dexterity. One of the most interesting and practical features of its main building are the three cantilevered boat-deck corridors along the entire southern front. These sun-flooded corridors have open-top partitions to north-facing classrooms which benefit from bilateral lighting and natural ventilation. Another feature is the southern façade, facing the broad campus, from which scintillating colors on the vertical fins and window frames, coupled with sunlight, shadows and sky reflections, form an inspiring and unforgettable picture. To make learning inviting, all instructional rooms are arranged, equipped and decorated in harmony with vibrant youth who add color-in-motion to the impressive scene. Throughout the buildings are service products of recognized superiority. Here, as in thousands of other fine buildings, are SLOAN *Flush* VALVES famous everywhere for efficiency, durability and economy.



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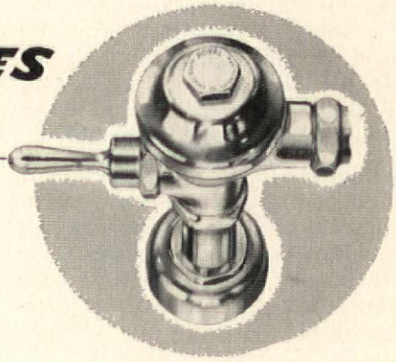


Extra lift for 1955 seen in sizable public works boost

Virtually all economic forecasters agreed 1955 was going to be a banner year, better than 1954—and construction activity would contribute as much or more than anything else to the renewed upswing.

The planning and development department of Prudential Insurance Co. said spending for all goods and services this year may reach $370 billion, a new record surpassing 1953. The National Industrial Conference Board, after a poll of industrial economists, was not quite so exuberant. It said their consensus was that this would not be the nation's record year for economic activity, but could well replace 1954 as second best.

Public works. Highly pleased administration officials rejoiced at the prospects of mounting prosperity; through public works they planned to do their part in boosting construction and the entire economy. Main fields in which it was anticipated the President would ask Congress to approve increased federal construction spending or financing: highways, schools, armories and military training facilities, public buildings. (Prudential's planning and development department predicted state and local government expenditures would rise about $2 billion this year, with a large percentage of the gain going into construction.)

While the President's legislative program was in preparation Washington observers reported it would reflect a decision to expand public works construction this year. The basic reason for this decision: Eisenhower's economic advisers feel the economy's growth might be held back unless basic public works keep pace with the nation's expansion. If business went sour and widespread unemployment developed, the program could be increased sharply as a make-work measure. Right now, however, the expansion was planned not so much as a short-run plan for creating jobs but as a long-run program for keeping public facilities abreast of growth in the private economy.

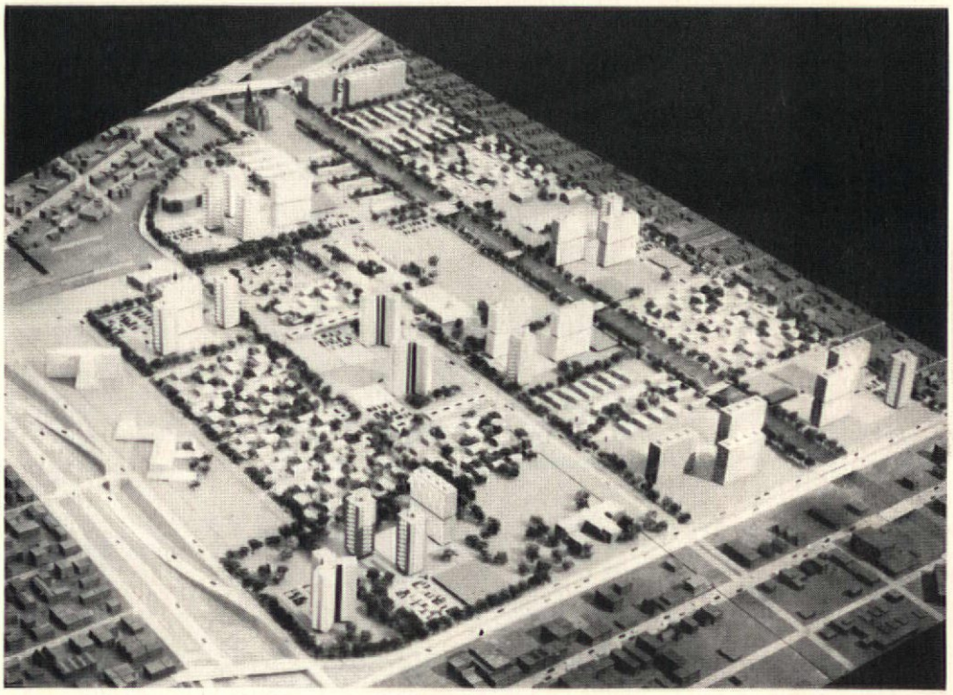
Easy payments. Concerned with taxes as well as spending, top administration officials were studying the extension of lease-purchase building activity to other fields besides post offices and public buildings erected under the direction of the General Services Administration. This easy-payment plan, with the cost of a project buried in the "rent" over a period of years, would allow the government to start a tremendous volume of buildings without making huge appropriations for their full cost in any single year.

For the present GSA officials and House and Senate public works committee members were reluctant to discuss specific details about a larger program. But Sen. Dennis Chavez (D, N.M.), new chairman of the Senate committee, made it plain this system had his full support, even though he also had one complaint about the initial projects launched under last year's legislation. "I think it's a great program," said Chavez. "I am complaining that nearly all the pilot projects should be from the eastern part of the country."

Last year GSA was authorized to make lease-purchase "rent" commitments totaling $5 million a year, enough to support about a $64 million building program. This year a boost to at least $10 million was anticipated by conservatives; others forecast a lease-purchase authorization large enough to support a building program of several hundred million dollars. The post office was ready to launch a lease and lease-purchase program for $300 million of new buildings.

Armed forces needs. Pentagon officials also anticipated a new construction program of uncertain dimensions if the President succeeds in selling Congress on his new military training program calculated to give the nation a huge trained reserve organization as an alternative to a large standing army. His new plan would offer young men the option of volunteering for an intensive six-months training period instead of full-length draftee service. If enacted, this would point to considerable construction for training, armory and reserve organization facilities.

For new construction outside the continental US, mainly for military bases, the federal government spent more than $750 million last year, and this year will spend close to $1 billion, according to the annual construction survey of the Associated General Contractors.



MODEL FOR GRATIOT-ORLEANS REDEVELOPMENT LESS THAN A MILE FROM DOWNTOWN DETROIT

Detroit unveils redevelopment to cure auto age problems

After viewing plans of Architects Minoru Yamasaki, Oskar Stonorov and Victor Gruen for a bold, comprehensive redevelopment of the entire Gratiot Neighborhood only 3,000′ from Detroit's downtown business center on Woodward Ave., Mayor Albert E. Cobo exulted: "We will push this plan into reality no matter what technical obstacles we meet."

Reported CIO President Walter Reuther, chairman of the planning and design subcommittee of the Citizens Redevelopment Committee sponsoring the plan: "HHFAdministrator Albert M. Cole told us that our plan was the most exciting thing in slum redevelopment that he had seen." (Also on the commmittee were officials of local AFL unions, Ford Motor Co., Hudson's department store and leading banks, savings and loan and mortgage finance firms.)

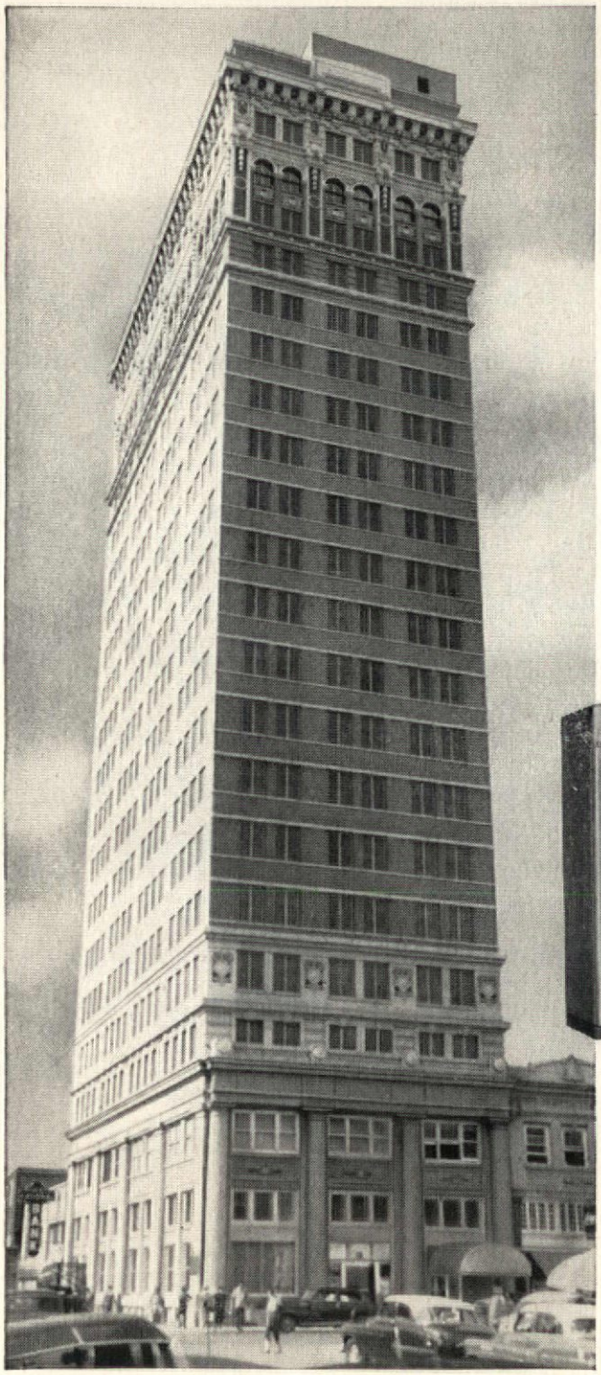
More than anything else the plan was an effort by Detroit as a community, workers and industry together, to pioneer a new type of modern urban redevelopment that would show cities everywhere how it was possible to solve the myriad downtown problems that were created when Detroit gave the world the automobile.

In the report accompanying their plan, Yamasaki, Stonorov and Gruen said its "broad planning aim is to reverse trends which threaten the very life of our great urban centers, and which have been brought about by the private automobile." They blamed this for declining population and a high percentage of low-income families in downtown areas, and for "economic and cultural impoverishment of downtown areas resulting in emigration of business, stores and office buildings to the suburbs."

To establish a pattern promising Detroiters redemption from these evils, this Gratiot plan (see cut) proposed an immense, parklike redevelopment for 4,400 families in a melding of modern single-family detached and semidetached houses, both row- and court-type garden apartments, and also high-rise buildings. Its public housing (about 1,100 units) would be dispersed into several areas, instead of one "ghetto."

G.E. HAS THE ANSWER TO AIR CONDITIONING PROBLEMS IN ANY OFFICE, STORE, OR FACTORY

Complete air conditioning for Southwest's first skyscraper requires minimum structural changes



Engineers made a complete climate survey of Amicable Life Building (above), then recommended the conversion of an old freight elevator shaft into equipment rooms on 19 floors to house the specified General Electric Packaged Air Conditioners.

SPACE AND MONEY ARE SAVED BY PUTTING G-E PACKAGED AIR CONDITIONERS IN UNUSED ELEVATOR SHAFT

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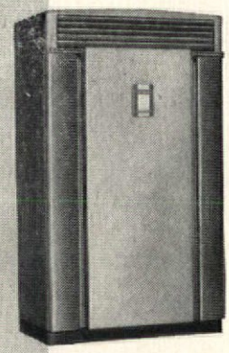

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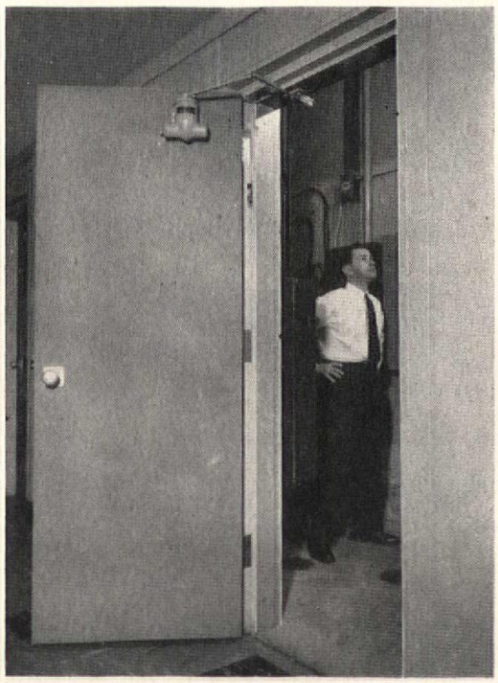

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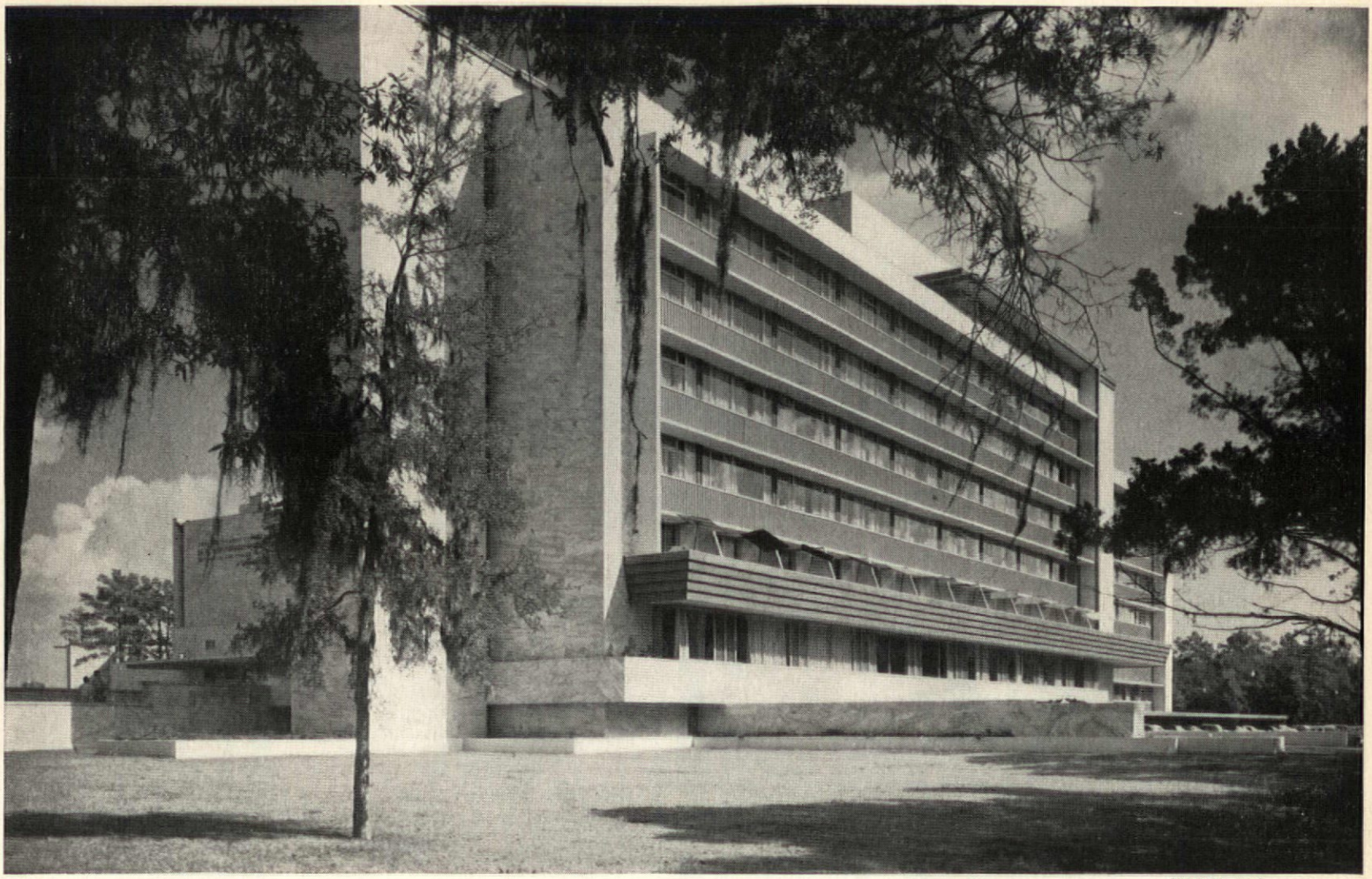

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Liberal rules issued, will help keep crippled public housing program alive

Cumbersome new requirements and limitations on public housing in the 1954 Housing Act have been stifling new projects.

To get the hobbled and curtailed program of 35,000 units for the current fiscal year moving, HHFAdministrator Cole sent a letter to mayors throughout the country last month explaining some liberal interpretations and procedures he was authorizing to "afford a practical basis to meet the immediate needs of eligible communities." Even to meet the June 30 fiscal year deadline under these inductive new procedures, Cole warned: "Communities will need to proceed with their applications as rapidly as possible."

Vacancy problem. One built-in restriction bars any new federal public housing except for families displaced from their homes by public improvements or government action. This posed a big question in big cities like New York and Chicago. Would vacancies in existing public housing have to be reserved to take care of displacees—thus reducing or eliminating eligibility for more new housing? Liberal interpretation: No.

Another restriction: the community also must have a comprehensive seven-point HHFA-approved "workable program" of housing conservation and code enforcement to deal with slums and blight.

By year's end HHFA was only able to certify "workable programs" for two cities, Clarksville, Tenn. and Somerville, Mass. Only 12 more had formal application for approval on file. Cole's liberal interpretation to speed some public housing applications into the pipe line: "Cities that can [reasonably be expected to] qualify with such programs before June 30 can proceed with plans and applications for new public housing units, although no annual contribution contract can be signed until the workable program is approved."

One quarter for N.Y. Under these liberal interpretations, the Public Housing Administration on Dec. 20 was able to announce its first OK for public housing planning under the new Housing Act: a $950,000 loan to New York City for preliminary work for a total of 8,000 units, or almost one quarter of the year's entire authorized federal program. This approval was granted even before New York had completed its "workable program" papers for submission to HHFA for checking and approval.

Up to Congress. Officially, the Eisenhower administration still favored keeping the public housing program alive after June 30. The White House let it be known that the President wanted approval for another 35,000 units in the next fiscal year beginning July 1, and the same volume for the following fiscal year. But it was strictly conjecture what size program the new Democratic Congress would adopt.

By indirection there was a tacit Republican approval for public construction of rental housing if private enterprise fails to provide it, in the FHA investigation report filed last month by Sen. Homer E. Capehart (R, Ind.), banking and currency committee chairman. In its introductory section appeared this paragraph:

"We have frequently been told that the building industry will not build multifamily rental housing unless the builder can make a fair profit out of the government-financed mortgage funds and also continue to own the property without any substantial investment. If that is the only alternative it is better that the government build such projects itself."

In the main this report merely reviewed and summarized the hearings held by the committee in various cities, made no recommendations for any new legislation pending a chance to see whether provisions of the 1954 Housing Act "cure the evils" it cited.

Florida architects O.K. contractor, engineer pacts

Under energetic leadership of outgoing President Igor B. Polevitzky of Miami, the 40th annual convention of the Florida Assn. of Architects laid the foundations for bringing together all elements of the state's entire building industry.

This Palm Beach conclave ratified a joint FAA-AGC statement on recommended bidding procedures; condemned the practice of architects (instead of the general contractor) approving subcontractors' bills; voted to continue AGC negotiations to smooth out other architect-contractor relations. It also ratified continuation of joint legislative action with the Florida Engineering Society; approved preliminary plans for financing joint "watch-dog" operations to protect the public against the shoddy or unsafe work of unlicensed architects or engineers; received from a joint architects-engineers committee a proposed policy statement on fields and construction types for which each profession should have prime design responsibility. The last will be distributed to all members for suggestions before any association action on it. (Next the committee is going to draft a joint policy on fees for interprofessional services.)

Secretary-Treasurer G. Clinton Gamble of Fort Lauderdale was elected president for 1955, and Edgar S. Wortman of Palm Beach, secretary-treasurer.

At its Dayton convention the Architects Society of Ohio elected C. Melvin Frank of Columbus as president, succeeding John W. Hargrave of Montgomery. Frank's principal objectives for 1955: "an aggressive campaign against the one-package-deal companies, who are making inroads into the architectural profession; also active participation by the society in rewriting the state building code."

SIDELIGHTS

AIA simplifies contest rules

To attract more entries for its annual honor awards, AIA announced a major innovation that should make it a lot easier for architects to submit their works. Instead of submitting entries on pressed fiberboard panels, henceforth architects need only furnish photos and descriptive material which can be placed in a uniform binder furnished by the honor awards committee. Entry applications this year must be received by AIA by Feb. 15, material by April 1.

Mobile law freezes style

Mobile and Boston are taking steps to preserve their historic areas. Mobile has adopted an "architectural control law" prohibiting construction that might alter the appearance of four main thoroughfares noted for their early southern buildings; Boston's Beacon Hill Assn. has filed a bill at the State House designed to regulate future construction, repairs or alterations to the exteriors of the district's tradition-soaked buildings visible from the street. Passage was urged, said an association spokesman, "so it won't be necessary 200 years from now for some Rockefeller to dig up Beacon Hill and reconstruct it."

Old North Church repairs set

Chas. R. Strickland, Boston architect and designer for the reconstruction of Paul Revere house in Boston and the fort at Plymouth, Mass. was picked last month to design a steeple for Old North Church in Boston to replace the one toppled in August by a hurricane. F. H. McGraw & Co., Hartford contractor who built the $1-billion Paducah atomic energy plant, will supervise repair of the historic tower on a cost-plus-nothing basis.

Code changes in St. Louis

St. Louis last month took steps toward revising its six-year-old building code, a specification type already well on its way to complete obsolescence. Mayor Raymond Tucker named a 13-man committee to work with Building Commissioner Albert Baum (one-time BOCA president) on a complete overhaul. At the same time the Board of Aldermen amended the present code to authorize metal panel exterior walls on some large buildings. This made possible immediate construction of one $6 million building, but its restriction to buildings exceeding 100,000 sq. ft. of floor space and its specific ban on metal panels in schools and hospitals were criticized as a sop to bricklayers, materials producers.

YMCA inhibits Hilton

The $14-million Beverly Hilton Hotel in Beverly Hills, Calif., was half way completed in November when the State Board of Equalization turned down its application for a liquor license. Under technicalities the hotel was too close to a school and a YMCA. Owners of the 410-room hotel, designed by Architect Welton Becket to include at least three bars, promptly appealed the ruling and hoped the board would soon reverse it.

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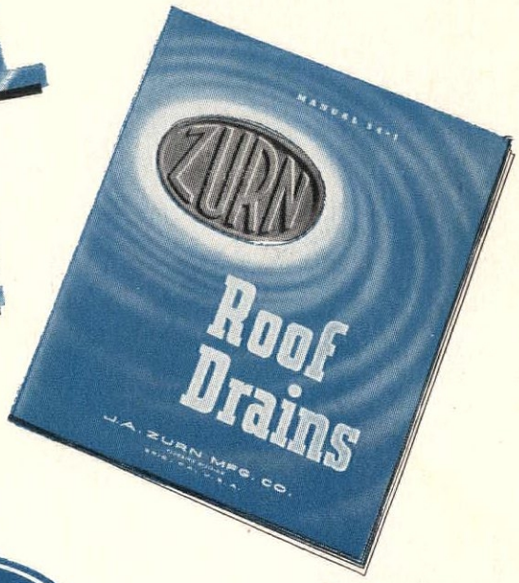

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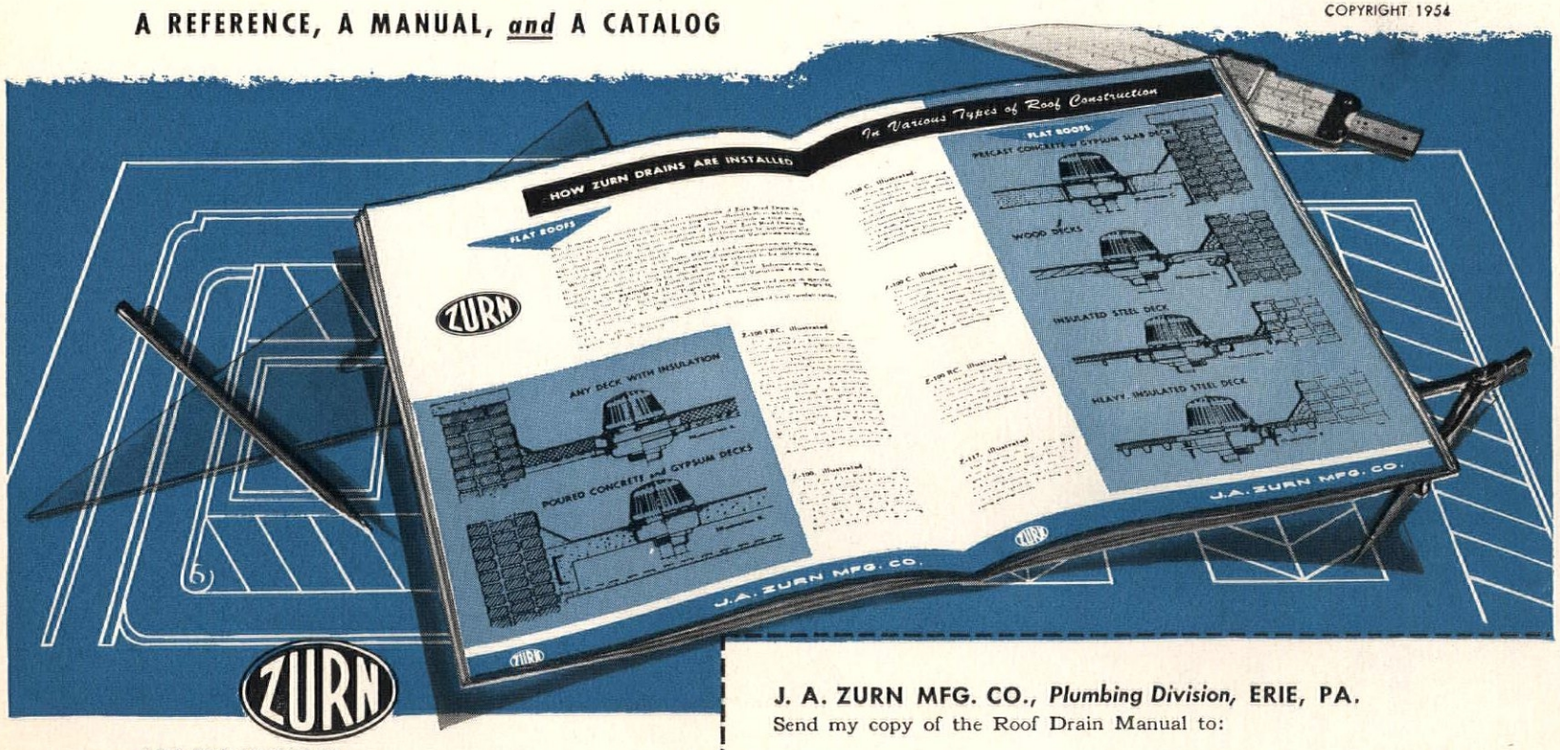

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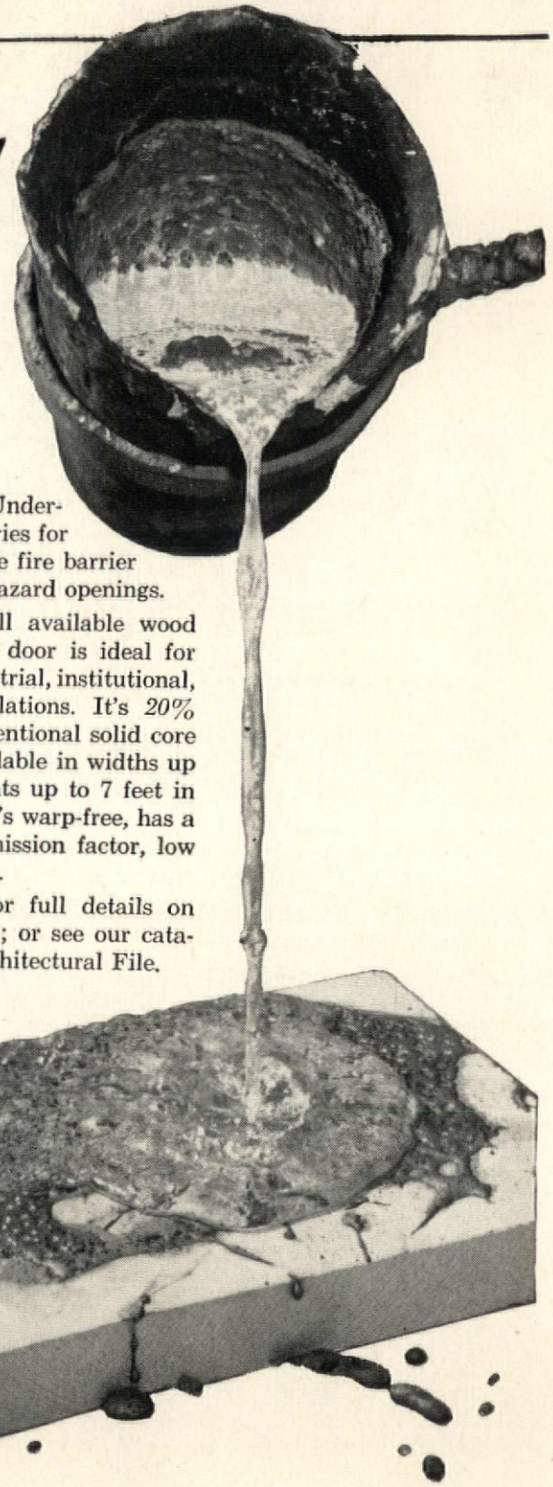

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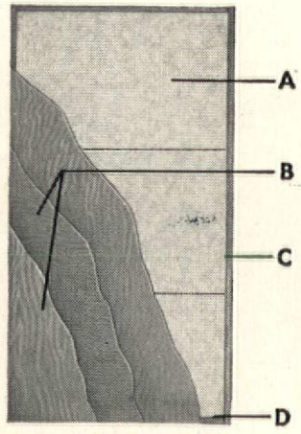

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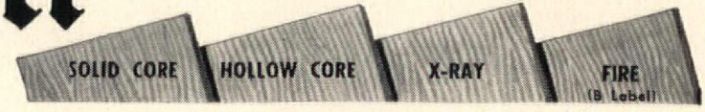

Labor will fight spread of state curbs, probably ask special US building laws

American labor faced two big problems as 1955 began: possible merger of the AFL and the CIO, and the spread of so-called state right-to-work laws. Construction labor had great, although not paramount, interest in both; primary aim of the building trades probably will be a legislative package all their own.

The AFL-CIO merger prospects were bright. Incentive: a unified 15-million-member, 145-union labor organization with tremendous political and economic strength. But there might be a stumbling block, and Presidents George Meany (AFL) and Walter Reuther (CIO) knew it as they cautiously conferred with the merger committee bigwigs of both groups. If there was any tampering with the structure, autonomy and jurisdiction of any of the big unions, especially those in AFL, the wrath and jealousy of the kings of a good many labor dominions would make short work of merger plans.

The AFL Building and Construction Trades Dept. already has rumbled a warning that it will not stand for CIO unions doing any original construction. Only seven of the 19 major building trades have signed the AFL-CIO no-raid compact. Ratification by other AFL unions is somewhat greater. On this point alone unity talks could break down, if Reuther persists in his insistence that jurisdictional truce must be pledged before there can be consolidation.

Right-to-work battle. Construction unions were more concerned over the rash of laws—on the books in 17 states so far—outlawing the denial of employment to workers who will not join unions after being hired. Popularly termed right-to-work laws, these statutes have been effective because a clause in the Taft-Hartley Act permits pre-eminence of state brakes on union shops.

Big test of the movement to spread right-to-work laws will come this year. Legislatures of all but four states meet, and employer groups will try to extend such laws from the South and West to the heavily industrialized northern and eastern states. Labor, thoroughly aroused, will be fighting back state by state. The biggest battle may come in Congress, where a Taft-Hartley amendment wiping out state sovereignty in restricting unions is sure to be introduced.

General contractors in states with restrictive labor laws like them; as a rule competing builders from union-shop states find nothing but trouble when they start projects in right-to-work states. Most of the lobbying for such laws, however, comes from the manufacturing industries.

Building unions hit lightly. A top-level figure in the building trades admitted that construction unions have not been hurt severely by state antiunion-shop laws, but said he could see some business gain of non-union contractors over union contractors in states where such laws are on the books. A general-contractor spokesman said: "State right-to-work laws force the building trades to sell the advantages of union membership instead of relying on coercion and tradition to get members."

Specialty contractors, for the most part, have shown little unhappiness with the sub-rosa closed-shop arrangements that are still the rule in building construction, even in right-to-work-law states.

Help from labor. Construction employer groups may quarrel with the AFL building trades on some points, but they have good reason for avoiding excessive belligerence:

Labor is giving vigorous, indispensable support to federally aided construction programs—highway, hospital and school expansion drives. What is more, Congress probably will not consent to making federally aided construction subject to state laws limiting or blocking union activity. For example, prevailing wage requirements —prevailing wages usually are union wages —are part of federal building programs, even FHA financing for multifamily structures. A showdown case occurred in Virginia some years ago. When the state, which has an antiunion-shop law, would not give a public housing contract to a union shop contractor who was low bidder, the Public Housing Administration said the union shop issue was insufficient reason to deny the low bidder the contract and therefore canceled the project.

Similar conflicts are probable under the expanding federal redevelopment program. Prevailing area wages are to be paid on most of the projects, and it is a foregone conclusion that states will have to knuckle under if restrictive labor laws conflict with the program.

Their own package. Rather than put themselves at the mercy of the pressures and counterpressures from other quarters for Taft-Hartley Act changes, building trades may go after special federal legislation, using as a precedent the railroad brotherhoods, who have enjoyed separate status since 1926.

Among the goals construction union leaders might hope to win through a separate federal construction labor law: shrinking to seven days the 30-day waiting period now required before a new employee must join a union; a union-shop provision bypassing Taft-Hartley representation elections, which simply are not held in construction because, say AFL building union leaders, they are unwieldy and unnecessary.

Davis-Bacon changes. Union pressure also is abuilding for changes in the Davis-Bacon Act to include employers' health and welfare plan payments as part of the "prevailing area wages" which the law requires contractors to pay on federally sponsored projects. The effect of such a change would be to minimize the disadvantage some union-shop contractors suffer when they bid for federal jobs against open-shop builders who do not make welfare plan payments.

St. Louis Post-Dispatch

JAMES BATEMAN (l) AND EVAN R. DALE

Labor leaders convicted for attempted extortion

In federal court in East St. Louis last month Union Chiefs Evan R. Dale and James Bateman were tried on charges of attempting to extort more than $1 million from Ebasco Services, Inc. for labor peace in the construction of the huge Joppa, Ill. private power plant to serve atomic energy facilities (a job that was withdrawn from Ebasco in July '53 after an interminable series of disruptive work stoppages).

Clinton J. Sammond, industrial relations consultant for Ebasco testified:

"I asked him [Dale] what we could do to settle the labor difficulties. He advised me to learn how to do business in southern Illinois. . . . Dale asked me: 'Do you have authority to commit Ebasco?' I told him I would have to consult my superiors. He replied, 'Unless you learn to do business in the manner customary in southern Illinois, you won't complete the job.' He bragged about 87 work stoppages which had occurred on a job at Grand Tower, Ill."

Among other witnesses, Edgar M. Stephens, a Cairo, Ill. contractor, and Thomas J. Scott, construction engineer for Maxon Construction Co. of Dayton, Ohio, testified that Dale had told them the "customary" way for builders to do business in his area was to pay a flat 1% in cash for labor peace.

As president of the southern Illinois District Council of the AFL Hod Carriers and Common Laborers' Union, Evan R. Dale, 38, controlled a pool of 30,000 construction workers in this area and adjoining portions of Kentucky. On the stand he denied all charges. Bateman, 63, was business agent for a Murphysboro, Ill., AFL pipe fitters' local. He did not testify.

After the jury found both guilty under the federal antiracketeering act, Judge Fred L. Wham sentenced Dale to 15 years in prison, fined him $10,000, and ordered him taken into custody immediately, so his union power would end sooner. Dale was "a menace to the labor movement," said Judge Wham, "has been disloyal to the men he represented . . . has a faculty for instilling fear of physical violence in people. He has never failed to profit in full from use of his abilities along this line."

Bateman escaped prison but was fined $2,000, placed on probation for five years and ordered to disassociate himself from any leadership in his or any other union.

Additional indictment returned against Dale last month: a charge of evading payment of $104,656 in 1948-53 income taxes.

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By F. J. KURTH | *Vice President of Engineering*

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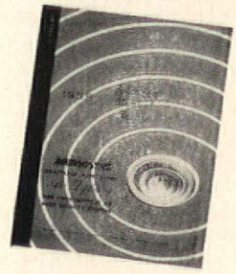

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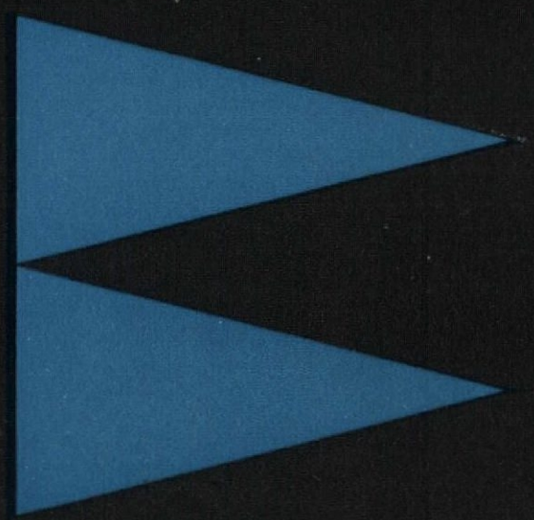

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Parking: public and private efforts gain speed in the face of municipal inertia

Cities began to explode 700 years ago when the adoption of gunpowder made walled and moated cities passé. The job was being completed by the auto; like 1955 kernels of popcorn, American cities were turning outward around their dense cores. But there was still plenty going on downtown to attract people, and as long as they preferred to move about by car, traffic and parking were sure to lead civic problems.

So big was the problem that some traffic engineers (a comparatively small group of advanced thinkers kept chronically short of operating funds by the cities that employed them) predicted a reversal in the nation's thinking about parking: in a few years, they said, street parking will be prohibited by statute everywhere, permitted only where specifically indicated by signs.

Expensive relief plans. Meanwhile, with expressways and arterial routes pouring more and more cars into obsolete networks of downtown streets, cities large and small were turning to a variety of measures for relief. These ranged from painted red zones at each end of parking spaces on Los Angeles streets (to allow clearance between cars and to speed parkers out of traffic lanes) to a grandiose $150-million plan to free 14 downtown Miami blocks for pedestrian shoppers by putting moving and parked vehicles on an elevated street network, fed by an arterial expressway system.

Some cities, notably Washington, D.C., were trying out big parking lots on the fringes of commercial districts, hoping that drivers would take buses to their downtown destinations. But, even as the city planned to construct eight fringe lots, drivers reinforced the traffic experts' opinion that they are not easily separated from their cars by driving past one free municipal lot. As soon as Capital Transit, which had been offering free bus rides downtown for lot users, started charging for its service, riders fell off considerably.

Fringe parking was in for another test: The Port of New York Authority was providing space for 800 all-day parkers in New Jersey, and was arranging for bus service between the lot and New York. No one doubted that the plan would succeed, for Manhattan's traffic jams and high parking charges have whipped even the most determined automobile commuters and shoppers.

Tangled plans. Big trend in parking was still toward downtown off-street facilities. Downtown grassy areas and substandard buildings, eaten up by the growing plague of insectlike cars, were being replaced in some of the more alert cities by parking garages. But inept, red-taped city governments in many cities were still decades behind the motor age; they were thinking of cars only as vehicles in motion, almost never at rest. San Francisco, for a bad example, was still tangled in proposals and counterproposals for parking lots and garages, five years after a parking authority was formed to get things done. New York was hardly a model of progress in providing for mid-Manhattan parking space. Anything like adequate garage space in the midtown commercial area seemed unattainable. Apartment dwellers in Manhattan were learning things about parking they had never known, and many a visiting traffic engineer gaped in awe at the morning crunch (8 o'clock on the east side, 11 o'clock on the west) in which all the cars on one side of all streets in a 1,200-block area were moved daily to the already packed other side of the streets for three hours so that street sweepers could cruise unimpeded. New Yorkers had come to measure clearance between parked cars in fractions of an inch and decibels of bumper bangs.

Public or private job? Two large cities, Chicago and Houston, were plunging ahead with solutions to the parking mess. In the fall a pickle salesman was the first parker in the first of nine city-built garages being erected in Chicago's Loop. The garages, which will take 6,500 cars off the streets daily, will be operated by private lessors.

Houston became an outstanding example of private development of downtown parking garages in recent months with a burst of announcements that six private groups were building garage space for nearly 4,000 cars. Houston had no shortage of investment capital, and lenders took the cheery attitude that every new office building should have its own garage.

Downtown parking was a big-city problem. Smaller cities and villages (50,000 population and under) were increasing their parking spaces faster than the rise of auto registrations, while cities over 50,000 population were losing ground, according to a survey of 892 cities by the International City Managers' Assn. One reason for inertia in the bigger cities was the prolonged fight between advocates of municipal and private financing for off-street parking facilities. The National Parking Assn., the voice of private developers, was clamoring to keep municipalities out of the parking business, while such spokesmen as Robert Moses, New York City construction coordinator, called municipal parking authorities the "best means of financing off-street parking."

NEAR-CAPACITY OPERATION in its first three months confirmed need for this downtown Chicago parking garage. Municipally built but privately operated, this 12-story 495-car depository is the first of nine for the congested Loop.

Joern Gerdts

BUILT FROM TOP DOWN, this 542-car self-parking garage in downtown Salt Lake City is the Zion Cooperative Mercantile Institute's reply to suburban store competition. The five parking floors were cast one at a time, starting from the top, around 40 precast, prestressed concrete columns. Cantilever slabs were cast in four-column bays; then forms were winched down floor by floor, removed at the bottom. Zigzag edges reduce dead load, act as parking spacers. Floors are split lengthwise, arranged so ramps can carry parkers from half-level to half-level.

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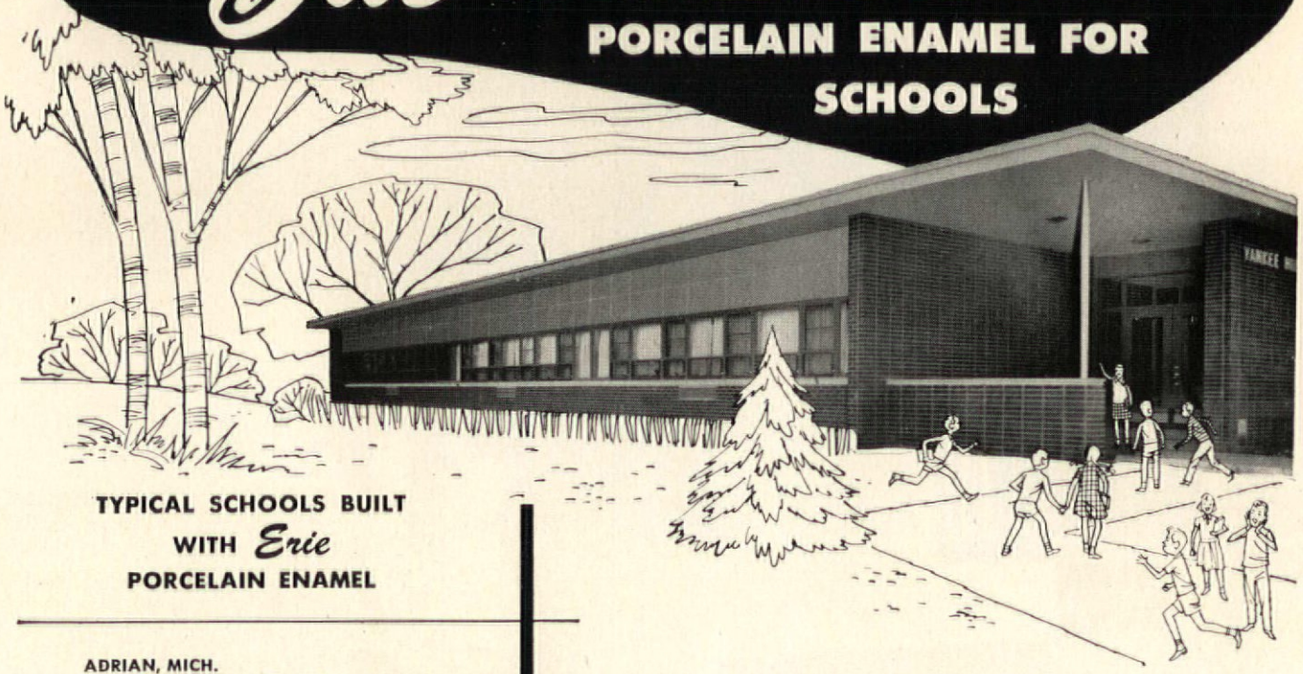

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Curwensville High School

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Ben Franklin Elementary

LANCASTER COUNTY, NEB.
Yankee Hill School

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Ludington Jr.-Sr. High School

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W. Va. Inst. of Tech. Science Bldg.

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NITRO, W. VA.
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O'NEILL, NEB.
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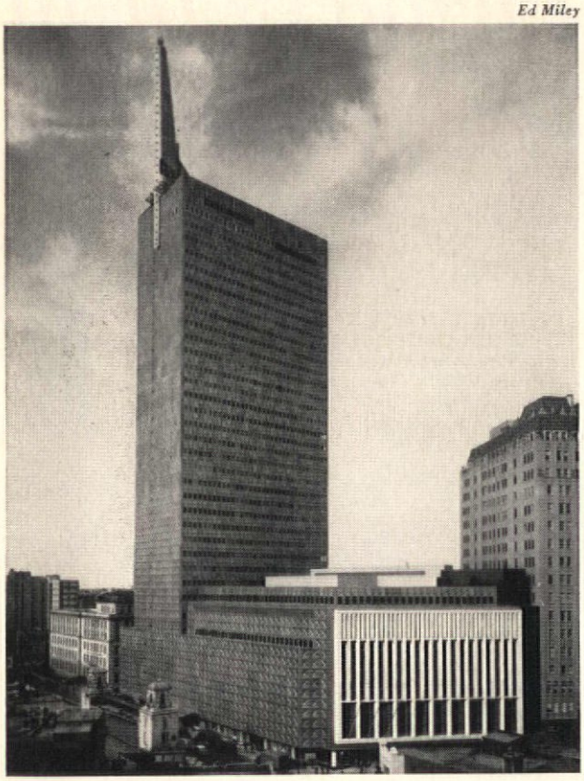
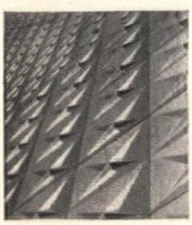
Ed Miley

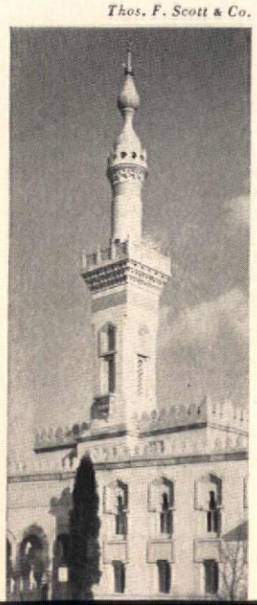




Ed Miley

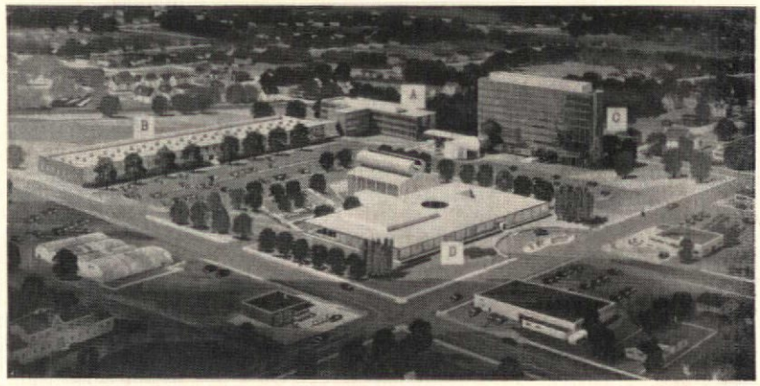
HALF-BILLION CANDLE-POWER beacon draws Texas eyes from 120-mi. to 40-story Republic Bank building, dedicated last month in Dallas. The $25-million, aluminum-walled building (skin detail at left) was designed by New York Architects Harrison & Abramovitz. Tower ("tallest and finest electrical display on any building in the world," claimed Fred F. Florence, president of Republic National Bank) is typical, inexplicable Texas phenomenon. Building is shorter than rival bank's, but tower gives Republic supremacy, for now.

Thos. F. Scott & Co.



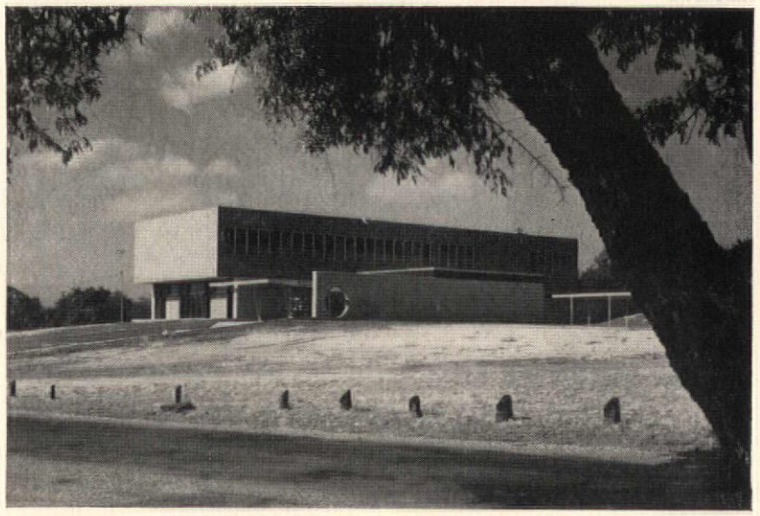
MUEZZIN'S PRAYER CALL (tape-recorded) will sound five times daily from minaret of mosque at new Islamic Center in Washington. Before center was built by A. Joseph Howar, Washington builder, who charged no fee, Irwin S. Porter & Sons, Washington architects, had to overhaul Egyptian design to meet local building practices. Cost (over $1.5 million) has been shared by 12 Moslem nations. Mosque faces Mecca (by great circle route). Center has elaborate carvings, sky-blue mosaics.

COMFORT FOR 5,000 FISH and convenience for spectators were matched by Pereira & Luckman, engineers and architects, in designing the Marineland of the Pacific oceanarium on Palos Verdes Peninsula, near Los Angeles. Visitors can look at sea creatures—big and little, fierce and placid—in 22'-deep tanks through ports of high-strength glass along three different levels of black-lighted corridors. Foundation to hold great weight of water was made by replacing poor topsoil with layer of new, compacted soil and then pouring 4½' concrete mat.

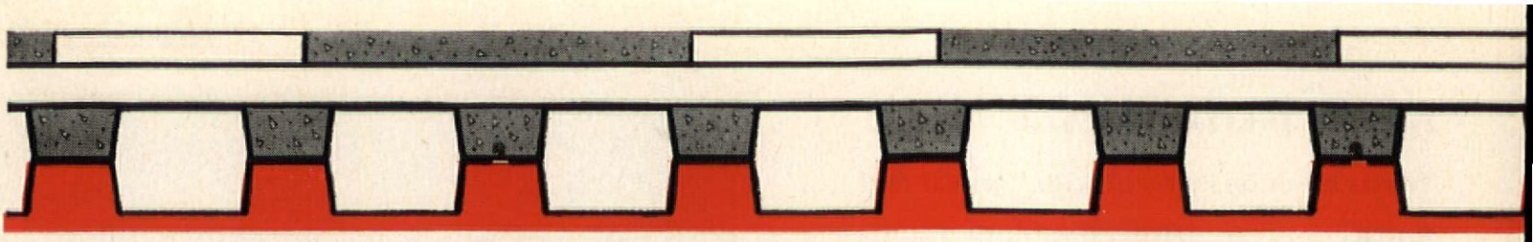


DESIGNED IN GLASS, the $7.5 million research and administration center for Corning Glass Works at Corning, N.Y., by Architects Harrison & Abramovitz, understandably features the client's own product. Project is a research laboratory (A), development shops (B), and office building (C), all adjacent to present Corning Glass Center (D). Research is important to Corning; 75% of its business is in products, many of them building materials, unknown 15 years ago. Lab and office building will be faced with structural glass, shops with glass block.

W. D. Smith



ART MUSEUM ON THE PLAINS of Texas was built to handle continuously changing activities and exhibitions rather than permanent displays. Designed for Fort Worth Art Assn. by Herbert Bayer of Aspen, Col., this $500,000 museum achieves exhibit floor flexibility through demountable walls and screens, continuous electrical ducts for lighting anywhere, and a floor that is a big tackboard (wood under cork). Resident architects: A. George King & Assoc., Ft. Worth.



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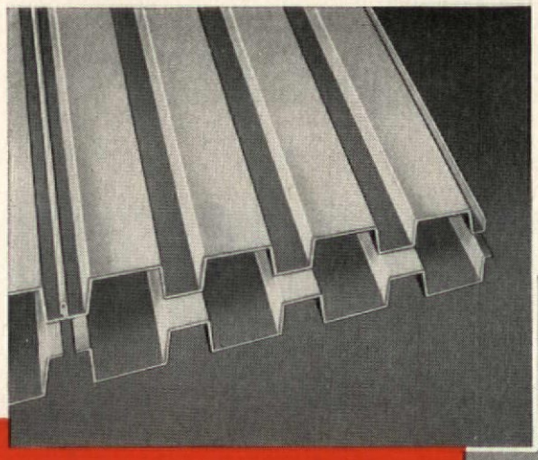

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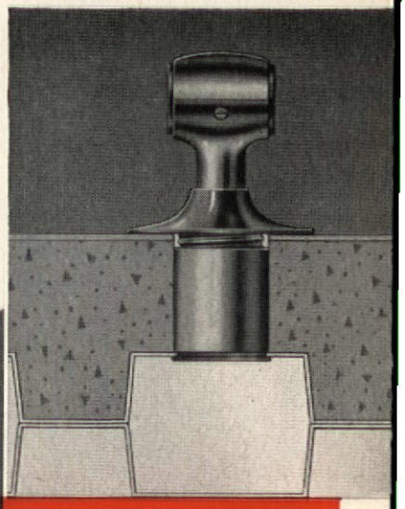

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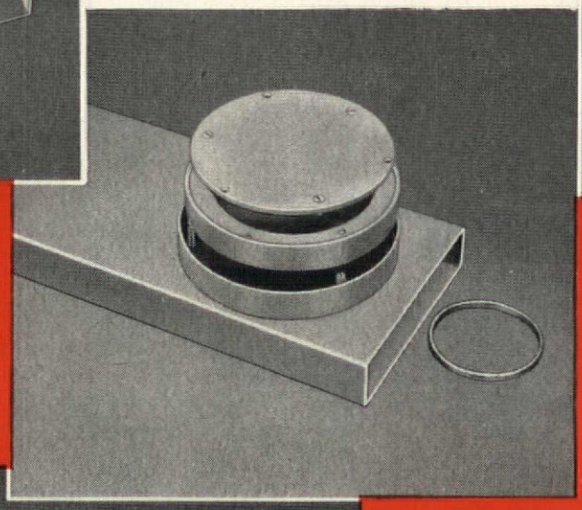

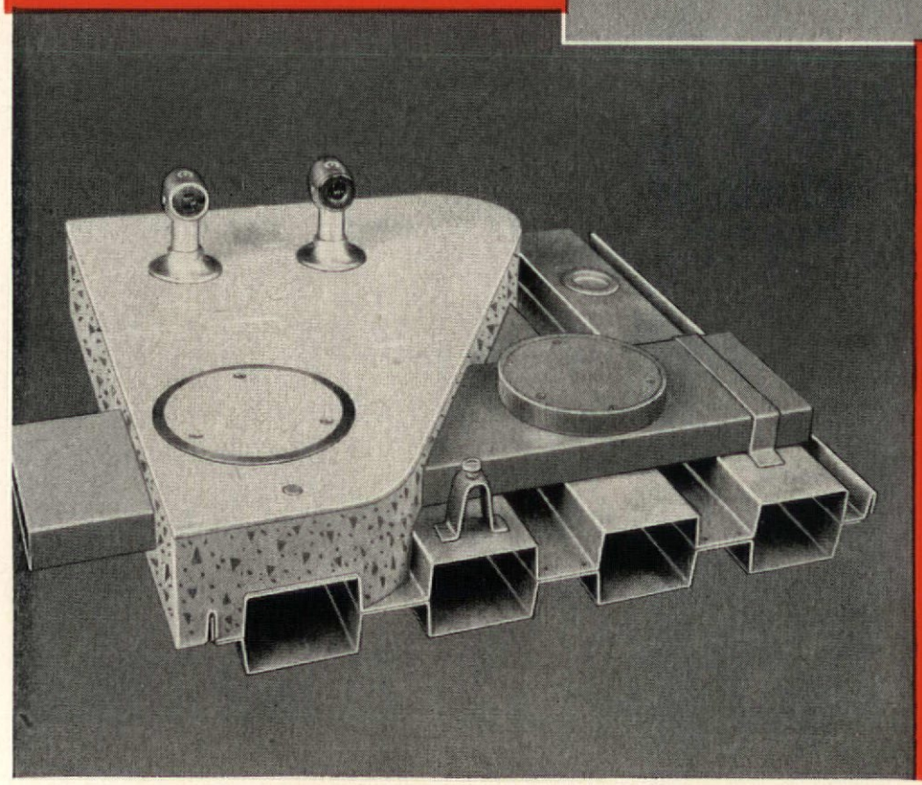

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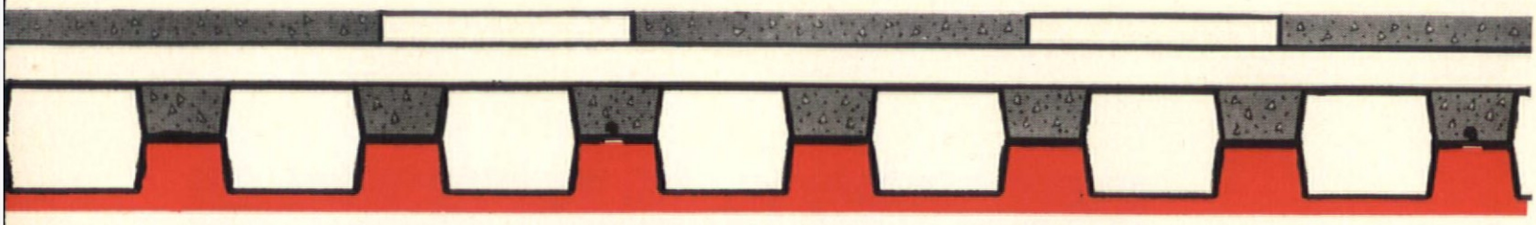

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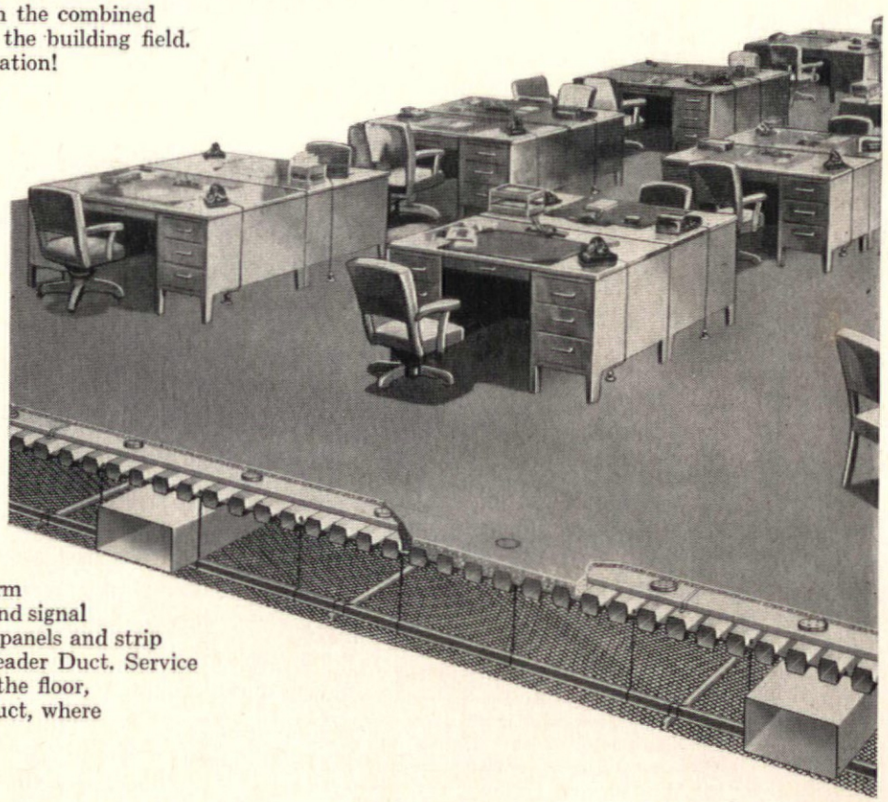

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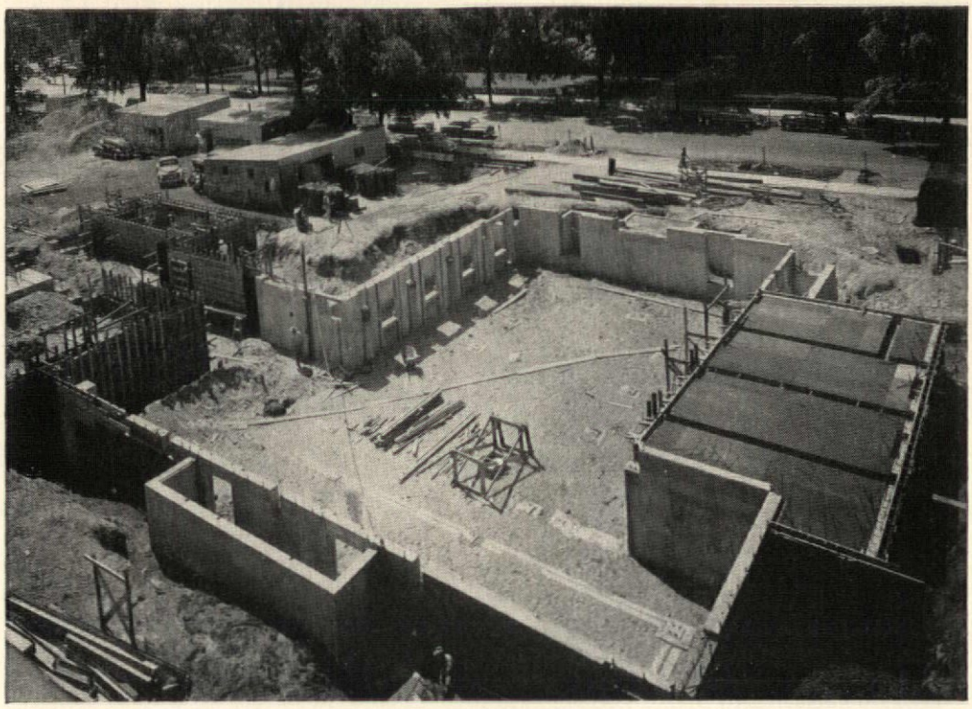

First Presbyterian Church
South Bend, Indiana
Architect: Harold Wagoner
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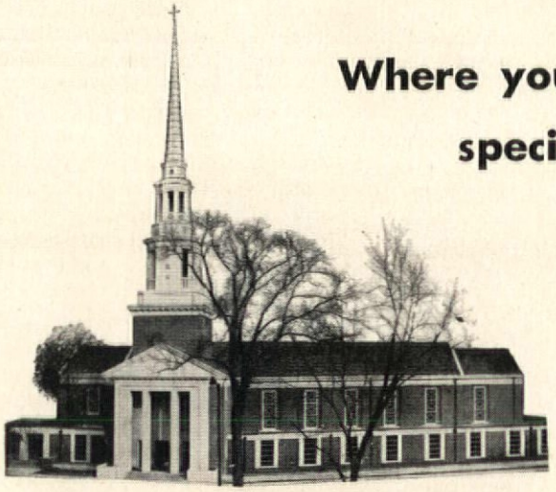

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PEOPLE

Pier Nervi coming to US to conduct seminars at North Carolina State; Lawrence Ottinger, chairman of US Plywood Corp., dies

Italy's brilliant construction engineer, **Pier Luigi Nervi,** will make his first trip to the US in April, coming at the invitation of the North Carolina State College School of Design to lecture and consult for 15 days. Nervi will hold student seminars, through an interpreter, and work with **Eduardo Catalano,** head of the school's architecture department, on problems of design in reinforced concrete, a specialty which has brought Nervi closer than perhaps any other engineer to setting an engineering architectural style. **Marcel Breuer,** codesigner of the UNESCO building, will join Nervi for three days, and the pair will hold an open seminar on that project. Most of the credit for getting Nervi to come to North Carolina, after other schools had failed, said **Dean Henry Kamphoefner,** goes to Catalano, who saw him in Italy last summer, persuaded him to come.

NERVI

New chief of New York State's Public Works Dept. is **John W. Johnson,** vice president and general manager of Brunner Asphalt & Construction, Inc., Buffalo road and bridge-approach contractor. He was recommended to Governor Averell Harriman by the New York State Society of Professional Engineers and by Erie County and state Democratic leaders (he is a staunch Democrat but never has been active in politics). Cornell graduate Johnson, 48, joined the Buffalo Sewer Authority in 1936 as an engineer, left it in 1953 as general manager. He succeeds **Bertram D. Tallamy,** who shaped the state's $2.8 billion postwar highway program and did a big rebuilding job on the 800-mi. Barge Canal system. Tallamy still has five years to serve as chairman of the state Thruway Authority.

AP

JOHNSON

Whether a mushroom-shape is out of place in the woods was the nub of an argument over a restaurant designed for a Yosemite National Park concessionnaire by **Frank Lloyd Wright.** National Park Service Director **Conrad Wirth** sent Wright's mushroom-roofed design back to the concessionnaire, Degnan, Donohoe, Inc., who have done business in the park for some 70 years. Wirth said he suggested roof changes because the building was unsuited not only to the park, but also to a rustic, pitch-roofed cluster of buildings among which it would be built. Explained Wirth: "We do not want a building there that will be visited as an attraction in itself rather than for the service it is supposed to render." Francis I. Donohoe defended the design: "Wright's design stands for itself; his work is always consistent with the grounds where he builds." The architectural world temporarily would have to reserve opinions on the building; no picture of it could be obtained from Wirth or the concessionnaire. Wright said, "politics"; later was inaccessible.

For 30 years Philadelphia Consulting Engineer **Charles S. Leopold** has worried about human comfort. In an age of loud concern about belching smokestacks and outdoor nuisances, Leopold poked quietly into the ingredients of discomfort of people in rooms: tobacco smoke, allergy-aggravating dust particles and heating methods. Last month he was the 13th recipient in 24 years of the F. Paul Anderson Medal, top award of the American Society of Heating and Ventilating Engineers. Some of his air-conditioning design projects: The Pentagon, the US Capitol, Madison Square Garden, Gimbels (New York and Philadelphia).

LEOPOLD

Noted City Planner **Charles B. Bennett** resigned last month as planning director for Los Angeles to join **Pereira & Luckman.** Bennett had been in public service for 35 years: he was a consultant to the National Resources Planning Board and the US Housing Authority in the thirties; from 1925 until 1941, when he became Los Angeles planner, he was Milwaukee's planning director; he was twice elected president of the American Society of Planning Officials.

Gladser Studio

BENNETT

NAMED: Architect **Albert E. Richardson,** out-and-out critic of modern architecture, as 18th president of the 186-year-old Royal Academy in London; **Alonzo W. Clark, John Gray Faron, Arthur S. Douglass, Thorne Sherwood** as chairman, vice chairman, secretary and treasurer of the Beaux-Arts Institute, which holds architectural design contests among students; **Bernard P. Day,** head of Joseph P. Day, Inc., New York real estate firm, as president of the New York Board of Trade; **Wells N. Thompson,** as president of H. K. Ferguson Co., contractor, unseated California Congressman **Oakley Hunter** (R) as general counsel of Housing and Home Finance Administration.

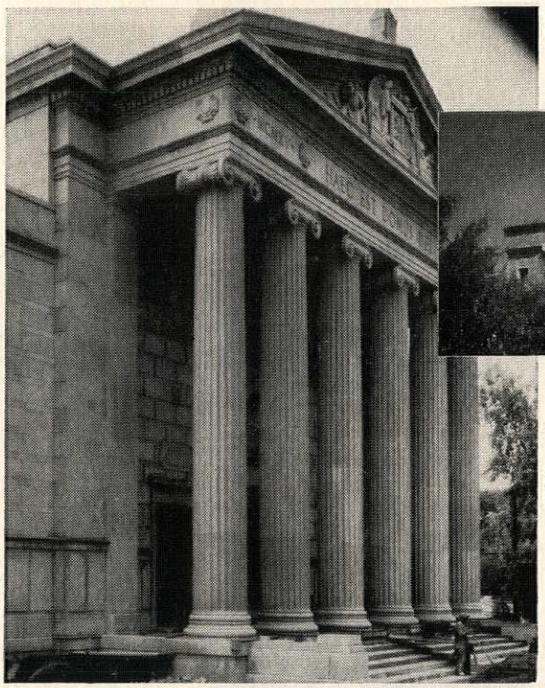
CONGRATULATIONS: to **Albert C. Martin & Associates** and **Thornton Abell,** recipients of top awards at the triennial honor award dinner of the southern California chapter, AIA. Martin was cited for the Los Angeles May Co. parking facilities (AF, June '54); Abell was honored for the design of his own office in West Los Angeles. Also to **William Charles Hays,** professor emeritus of the University of California School of Architecture who received the honor award of San Francisco's Building Industry Conference Board, and to **Atholl McBean,** San Francisco civic leader and ceramic veneer manufacturer, who won the board's achievement award.

DIED: **Russell F. Whitehead,** 70, architect, editor and authority on colonial and early American republic building design, Dec. 2 in Albuquerque. In a lifetime devoted to a profession he loved, Whitehead, after seven years as a draftsman, in 1912 was named editor of *Architectural Record,* in 1913 became editor and part owner of *The Brickbuilder,* predecessor of ARCHITECTURAL FORUM, and in 1925 editor of *Pencil Points.* He was probably best known for his famous "White Pine" monographs on early American buildings, published from 1916 to 1940. From 1924 to 1940 he also practiced architecture in New York, where he was secretary of the Architectural League. After retiring to Albuquerque ten years ago he became a specifications writer there.

OTHER DEATHS: **Lawrence Ottinger,** 70, board chairman of US Plywood Corp., a company he founded in 1919 with $500 and which he boosted to the biggest in its field, with a gross of $124 million annually, Dec. 19 in Scarsdale, N.Y.; **Norman Alpaugh,** 69, architect for many of Los Angeles' largest buildings, including Town House and the Park Wilshire, also collaborated on design for 300 theaters for the Fox chain, Nov. 15 in Los Angeles; **Joshua D'Esposito,** 76, engineer on Chicago's subway and designer of the *Chicago Daily News* building, Nov. 16 in Evanston, Ill.; **Mrs. Catharine Baker Sleeper,** 56, wife and close business associate of Harold Sleeper, AIA (former president of the New York chapter), herself an active worker in New York City architects' groups, Nov. 28 in an auto accident in New Haven, Conn.; **Frank Williams,** 89, city planning and zoning pioneer whose studies were influential in the adoption of New York City's 1916 "Building Zone Resolution," called the "first comprehensive zoning ordinance in the US," Dec. 5 in New York.

M. Garber

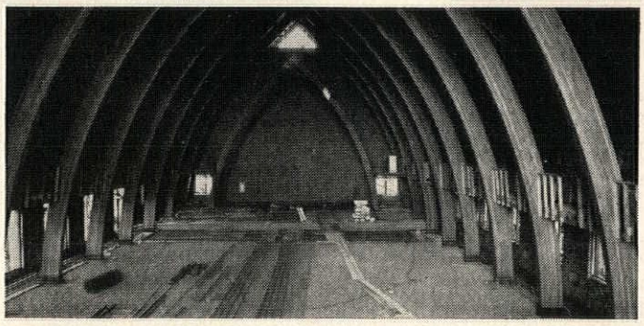
OTTINGER



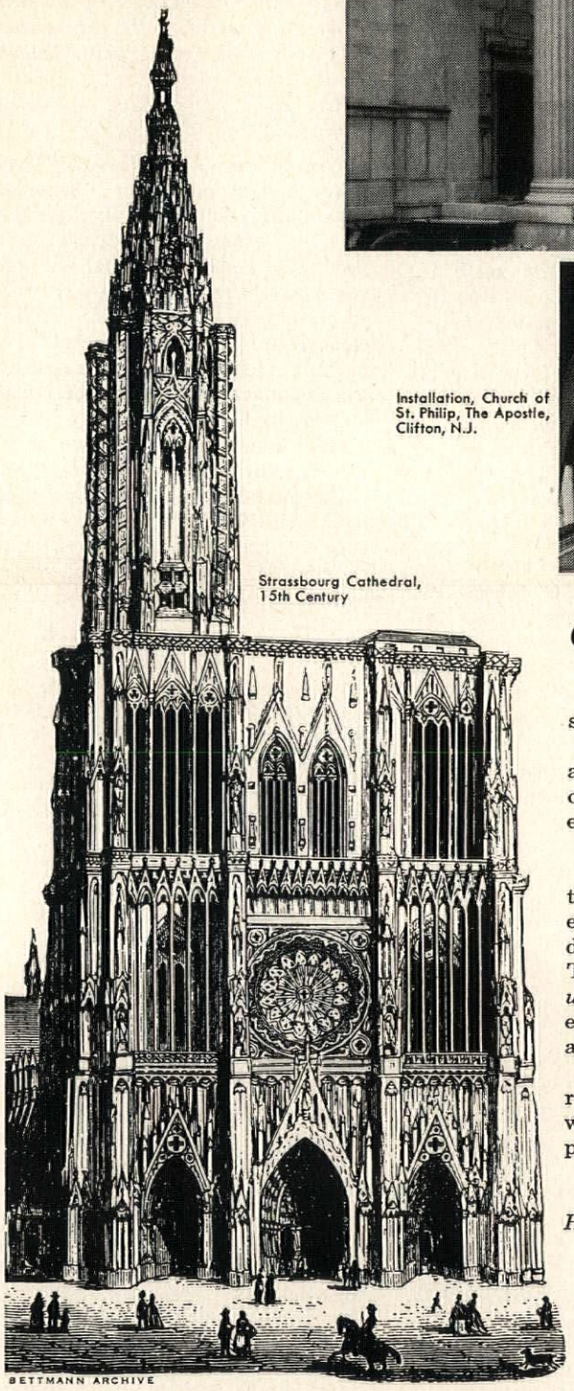
St. Ann's Church
Cleveland Heights, Ohio

The Vivian Webb Chapel, Claremont, Cal.

St. John's Church, Delphos, Ohio



Installation, Church of St. Philip, The Apostle, Clifton, N.J.



Strassbourg Cathedral, 15th Century

BETTMANN ARCHIVE

COMFORT GOES TO CHURCH

Throughout the ages the nobility of man has found no higher expression than in the beauty of the world's churches, temples and cathedrals.

But the majesty of a fifteenth century cathedral, with its lofty spires and delicate filigrees of stone, is no more wondrous than its modern counterpart of perhaps lesser artistry but far greater *comfort* that encourages attendance at worship.

Yes, *comfort* goes to church, now . . . and so do millions more people.

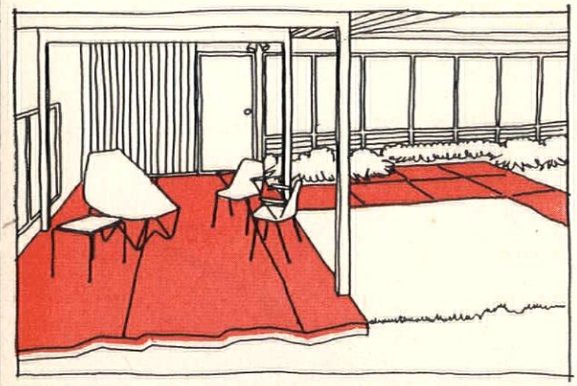
One of the greatest advances in achieving church comfort has been the widespread adoption of radiant heating. For no heating is quite as effective as the gentle, all-permeating, sun-like warmth . . . without drafts, currents, or dead spots . . . achieved by modern radiant heating. Today's church designers know that radiant heating, which assures *utmost* comfort and health protection for both the very young and the elderly groups within congregations, is also ideally suited for every other age of worshippers.

They know, too, that *steel pipe* is the most accepted medium for radiant heating systems . . . in fact, the most widely used pipe in the world for heating, plumbing, snow melting, fire sprinkler systems, and power, steam and air transmission.

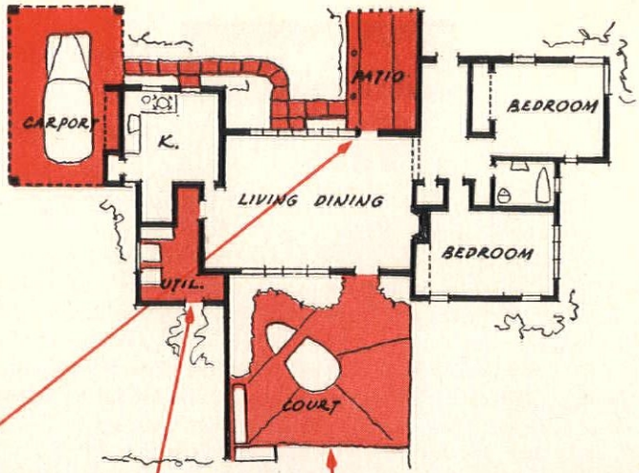
Send for your free copy of the 48 page color booklet "Radiant Panel Heating with Steel Pipe" and let comfort go to your church, too.

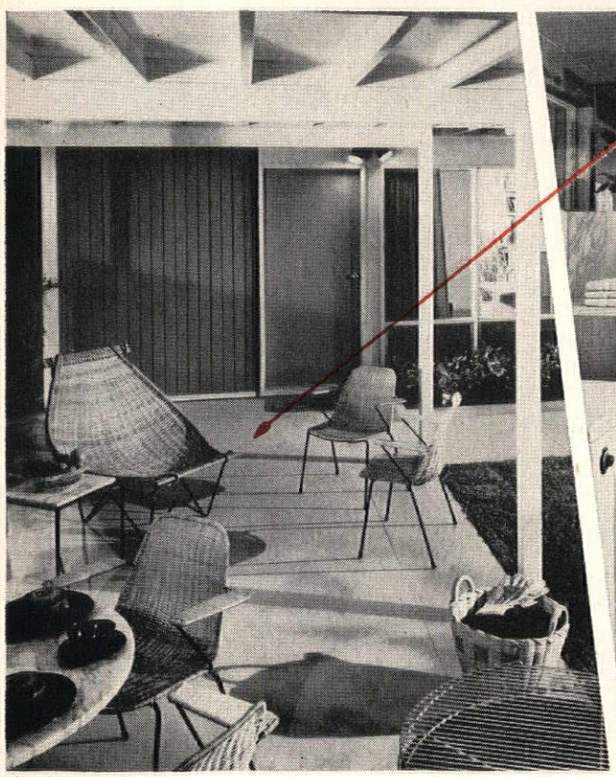
Steel Pipe is First Choice

Committee on
STEEL PIPE RESEARCH
AMERICAN IRON AND STEEL INSTITUTE
350 FIFTH AVENUE, NEW YORK 1, N. Y.



Fused color. *Not a paint or coating! Colorundum is troweled into the concrete topping and becomes an integral part of the surface, producing beauty and durability.*





Nat'l Homes Corp. photo

J. Shulman photo

E. Braun photo

Beautify concrete floors

Colorundum floors give luxury appearance and extra wear resistance at low cost

Here's a simple and economical solution to the problem of exposed or uncarpeted areas of drab, colorless concrete. It's called Colorundum. And the fused-color concrete floor it provides lends a dramatic and practical accent to patios, walkways, and service floors. Colorundum cuts air conditioning costs, too, because its color properties keep sunlit areas substantially cooler than ordinary concrete. Yet its cost is just a fraction of that of tile floors.

Colorundum is far more resistant to traffic than ordinary concrete floors. It is a balanced formulation of nonslip aggregate (next to the diamond in hardness), water-repellent compounds, and durable colors . . . contains no silica, quartz, or sand. It is easy to keep clean, and since it contains no metal, it will not rust or stain.

Colorundum is available in eleven decorator colors.

Subsidiary of Sun *Chemical Corp.*

A. C. Horn Co., Inc.

Dept. H11-116, Long Island City 1, N. Y.

Please send me complete information on Colorundum.

*Name*_____ *Title*_____

*Firm*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

TRENDS

Materials producers prepare for another record building year; scare buying not prevalent, but prices continue to move higher

Would the record volume of construction expected this year send up prices of building materials?

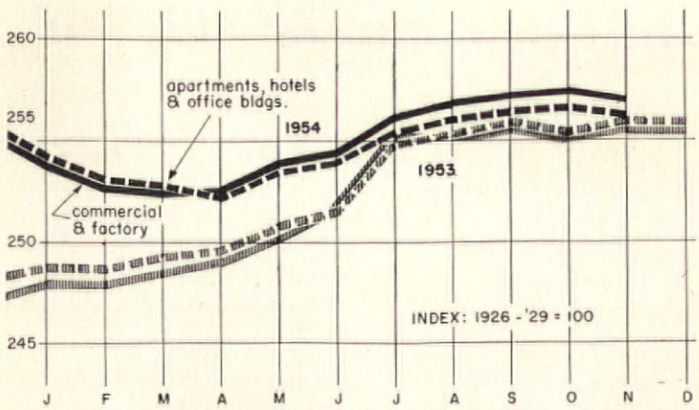
So far, little or no scare buying has been reported except for plasterboard, in short supply in parts of the South and Midwest, and material producers were predicting that 1955 would exceed 1954 in just about every respect. But lumber prices (and production) edged up unseasonally in the Pacific Northwest as a result of increased buying both for immediate shipment and for spring delivery. In mid-December some varieties of fir lumber were up to $75 mbf, $2 higher than November. Possibilities of further lumber hikes were presaged by the report of the Oregon-Washington governors' fact-finding committee, formed to recommend a settlement to the 2½-month strike which ended in September. This report suggested a 7½¢-per-hour increase effective Jan. 1.

The steel industry, having produced about 87 million tons in 1954—the second highest peacetime year in history—looked for a 10% to 20% increase in output in 1955. A 20% increase would boost production well over the peacetime high of 111 million tons produced in 1953. One firm facing the new year with particular relish was Chicago's Inland Steel, recently embarked on a $35 million expansion program and driving for a bigger share of the construction market. (Inland plans to build its own 18- to 19-story office building in Chicago.)

Increased production also was foreseen by cement, paint and gypsum producers. Many cement mills have expansion programs underway to keep abreast of the anticipated high level of building and public works construction. Northeast cement prices were lifted as much as 15¢ a bbl. last month, an increase which served mainly to bring prices in this area up to those elsewhere. Paint manufacturers are looking to a 3% to 5% increase in sales this year, while the gypsum situation might well be typified by the experience of the Kaiser Gypsum Co.'s $4 million plant in Seattle, which opened in September. Though scheduled to go into round-the-clock production in late spring, 1955, demands on its products—an annual 35,000 tons of gypsum wall-board and other sheathing—were so heavy that its work force of 170 started seven-day, three-shift production in October.

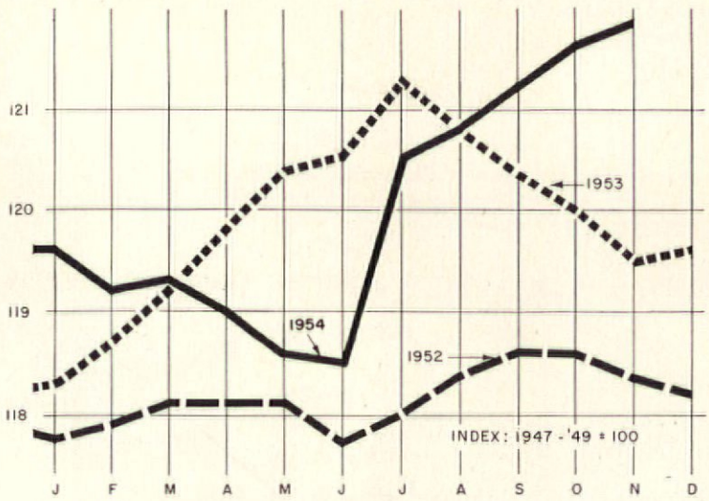
One striking contrast to the general optimism was supplied by Malcolm A. Schweiker, president of American Encaustic Tiling Co., producer of ceramic tiles and bathroom accessories. Last month he told stockholders his company "had no definite plans for expansion at this time because none of us can tell when the current building boom will end."

BUILDING COSTS



After hitting new highs for two straight months, E. H. Boeckh & Associates' building costs indexes dipped slightly in November. Apartments, hotels and office buildings slid 0.3 points to 256.1; commercial and factory buildings were off 0.2 points to 257.0.

MATERIALS PRICES



BLS's wholesale building materials price index rose to a new high for the third consecutive month in November, edging up 0.2 points to 121.9, and 2% above the November '53 level. The advance was caused by slight increases in lumber prices which offset minor declines in cement products and nonmetallic minerals.

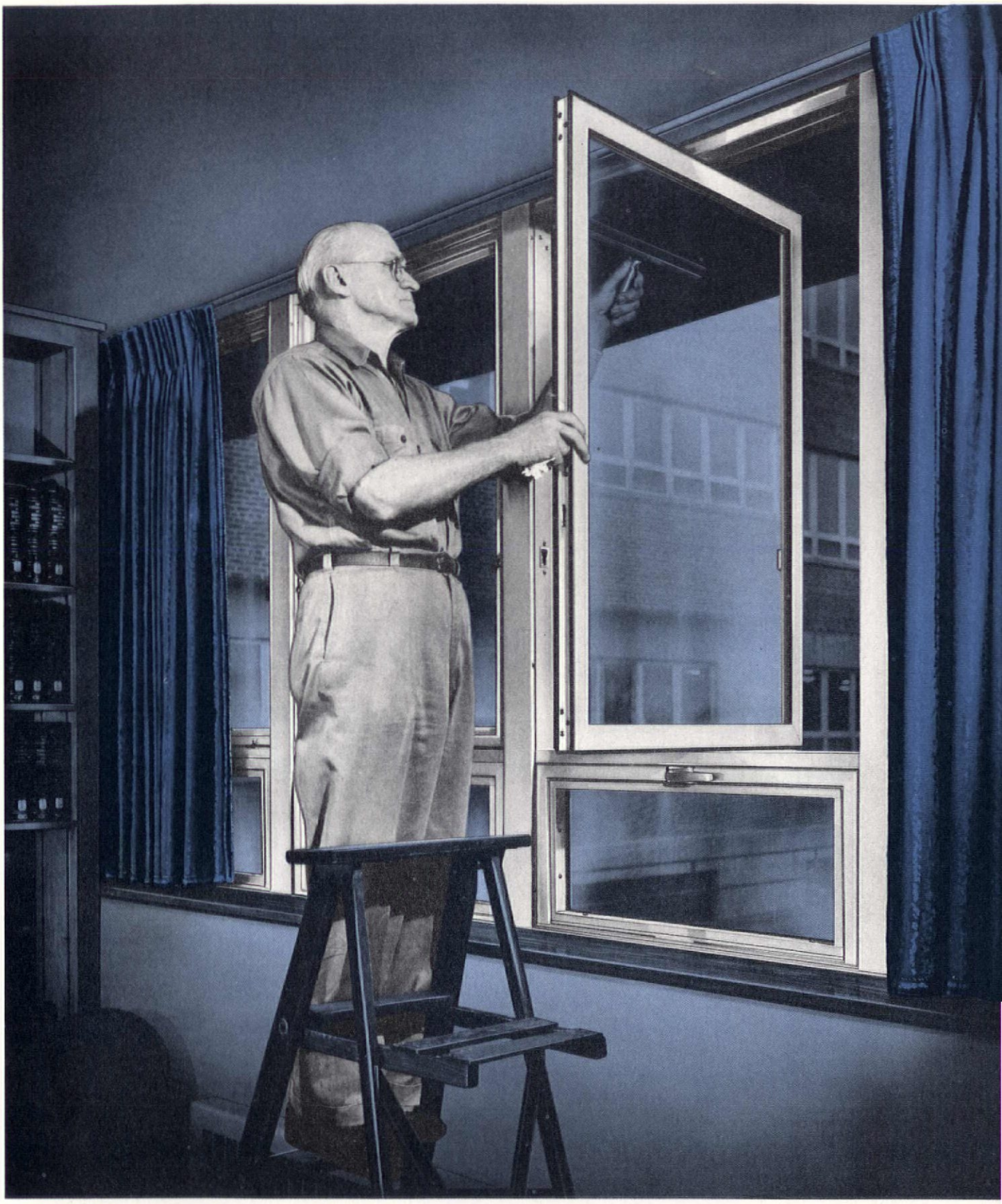
NEW CONSTRUCTION EXPENDITURES

(millions of dollars)

Type of construction	November 1953	November 1954	November Per-cent change	First 11 months 1953	First 11 months 1954	First 11 months Per-cent change
PRIVATE						
Residential building (nonfarm)	1,034	1,267	23	10,979	12,146	11
New dwelling units	915	1,150	26	9,705	10,830	12
Additions and alterations	94	95	1	1,030	1,042	1
Nonresidential building	523	551	5	5,173	5,655	9
Industrial	177	169	—5	2,052	1,839	—10
Commercial	192	200	4	1,609	1,996	24
Other nonresidential building	154	182	18	1,512	1,820	20
Religious	46	59	28	427	531	24
Educational	41	53	29	386	509	32
Social and recreational	17	17	0	147	195	33
Hospital and institutional	26	29	12	291	307	5
Miscellaneous	24	24	0	261	278	7
Farm construction	106	118	—10	1,628	1,467	—10
Public utilities	393	386	—2	4,069	4,051	0
All other private	9	12	33	111	109	—2
*PRIVATE TOTAL	2,077	2,322	12	21,960	23,428	7
PUBLIC						
Residential building	43	23	—47	517	319	—38
Nonresidential building	353	360	2	4,002	4,230	6
Industrial	131	104	—21	1,635	1,435	—12
Educational	154	181	18	1,576	1,896	20
Hospital and institutional	23	27	17	330	326	—1
Military facilities	96	90	—6	1,229	863	—30
Highways	286	300	5	2,991	3,340	12
Sewer and water	75	84	12	790	894	13
Conservation and development	66	60	—9	769	667	—13
*PUBLIC TOTAL	947	941	—1	10,584	10,641	1
*GRAND TOTAL	3,024	3,263	8	32,544	34,069	5

* Minor components not shown, so total exceeds sum of parts.

Commerce-Labor Dept. monthly tabulations show that declines in farm, industrial and military construction have been offset by big boosts in home and school building. Housing starts for the first 11 months of 1954 were 1,122,800, 8% above the same period in 1953. November's starts (103,000) showed a seasonal drop from October's, but still set an all-time November record.



The revolutionary **Adlake** *reversible windows*

- **slash cleaning costs**
- **eliminate maintenance**
- **reduce air conditioning and heating costs**

for these outstanding buildings!

Adlake Series 1000 Reversible Window
East Unit, Baptist Memorial Hospital, Memphis, Tenn.
Architects: Office of Walk C. Jones, Jr.
Consulting Architects: Samuel Hannaford & Sons
General Contractor: Harmon Construction Company
Adlake Series 1500 Reversible Window
Rockford Memorial Hospital, Rockford, Illinois
Architects: Hubbard & Highland,
Perkins & Will
General Contractor: Security Building Company
2000 Reversible Window
nce Co. of America, Chicago, Illinois
and Murphy
ors: George A. Fuller Company
PRUDENTIAL
Adlake Series 2000 Reversible Window
The Alcoa Building, Pittsburgh, Pennsylvania
Architects: Harrison & Abramovitz
Associate Architects: Mitchell and Ritchey,
Altenhof & Bown
General Contractor: The George A. Fuller Co.

These are typical **Adlake** reversible window installations

Here's why YOU should specify Adlake reversible windows:

Never need paint!
They last the life of the building

Never rust, never rot!
Because they're made of aluminum

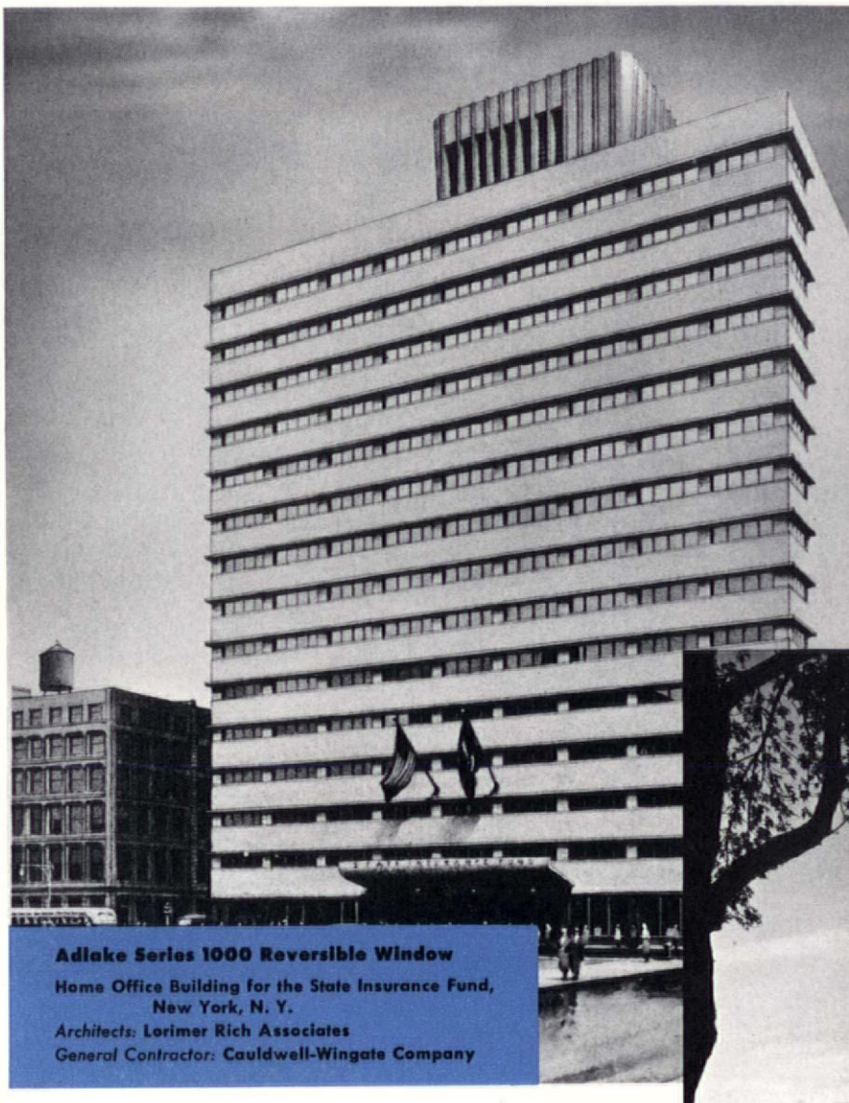
Cut window cleaning time!
All cleaning is done *inside* the building

Slash liability insurance rates!
No window cleaning hazards

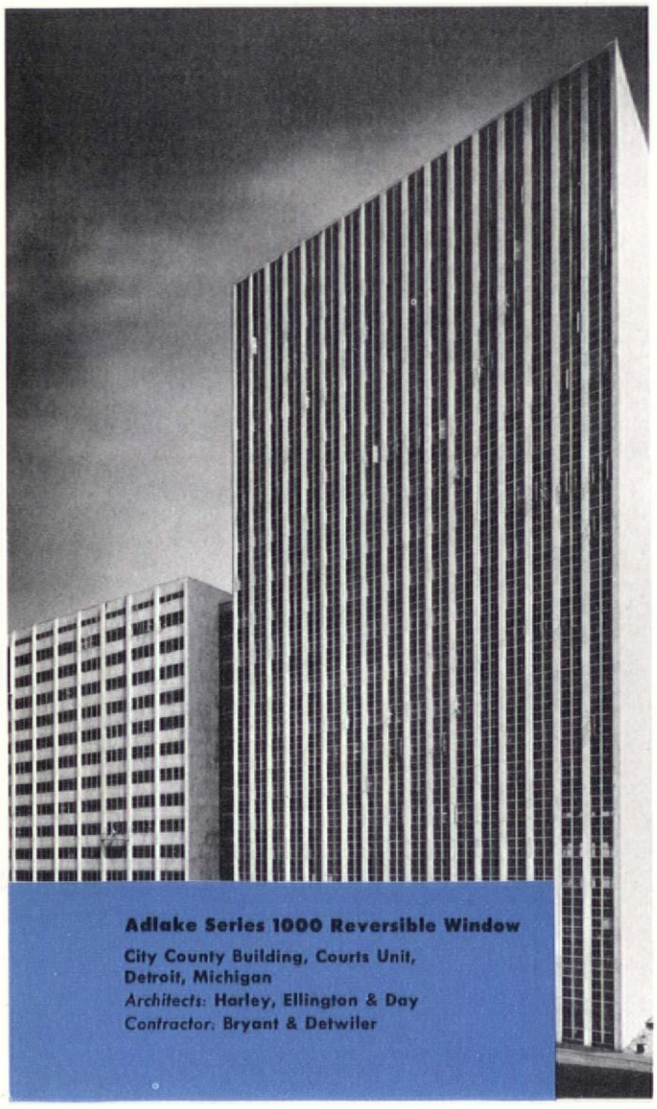
Never rattle, never stick!
Easy to operate

Easy to install!
Ready to be fitted in openings

Reduce air conditioning and heating costs!
Less air infiltration



Adlake Series 1000 Reversible Window
Home Office Building for the State Insurance Fund, New York, N. Y.
Architects: Lorimer Rich Associates
General Contractor: Cauldwell-Wingate Company



Adlake Series 1000 Reversible Window
City County Building, Courts Unit, Detroit, Michigan
Architects: Harley, Ellington & Day
Contractor: Bryant & Detwiler

The Adlake windows on these leading buildings are cleaned from the inside

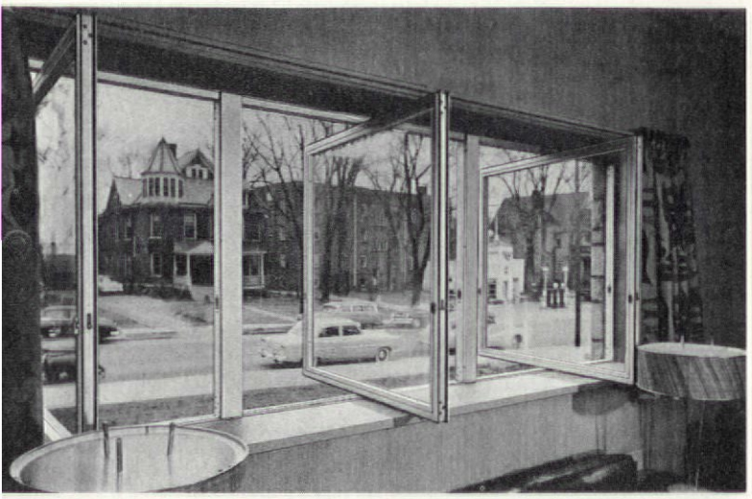
That means lower window washing costs and lower insurance rates!

It costs *money* every time a window cleaner climbs gingerly out onto the window ledge! It's dangerous work, costly work, and slow work. And it's *useless* work, with Adlake reversible windows. These windows can be cleaned *entirely from the inside of the building.* Your window cleaning contractor or crew can clean more windows for less money. Or your regular janitor or cleaning staff can handle the window washing chore in complete safety.

How about other maintenance? There isn't any! For these Adlake windows are aluminum. That means they can't rust, can't rot, and never need painting. They keep their good looks for the life of the building, with *no* maintenance!

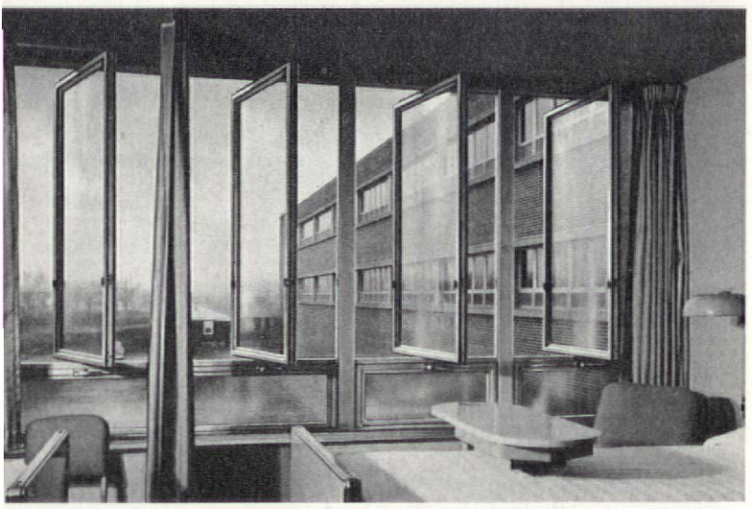
And that's not the only place Adlake windows save! Their unique weatherstripping makes possible a tight, lasting seal that brings real savings in lowered air conditioning and heating requirements. Your Adlake Representative will be glad to show you air infiltration test figures you wouldn't have thought possible.

One of these types of Adlake reversible windows is the right choice for your building!



The Adlake Series 1000 Reversible Window

All aluminum construction with double weatherstripping of guaranteed non-metallic rubber impregnated fabric, permanently bound in an aluminum binder which may be easily removed. Window may be cleaned completely in a few seconds, from the *inside*. Between washings, windows are securely locked by special locking devices, to prevent unauthorized operation.



The Adlake Series 1500 Reversible Window

Identical with the Series 1000 Window, but is equipped with a vent below or above, for ventilation when required.

The Adlake Series 2000 Reversible Window

This aluminum window features an exclusive inner-tube principle of weather-stripping that gives dependable, positive weather seal, reducing air-conditioning and heating capacity requirements to an absolute minimum. Cleaners may deflate tube and reverse the window for cleaning in a few seconds.

All Adlake Reversible Windows are available for double glazing, if desired.

SEE SWEET'S ARCHITECTURAL FILE for complete information, or write:

Adlake 98th year of serving the transportation and building industries

The Adams & Westlake Company

Established 1857 • ELKHART, INDIANA • New York • Chicago

SALES OFFICES: 319 W. Ontario Street, Chicago, Illinois • 224 Penobscot Bldg., Detroit, Michigan

Sales Representatives in principal cities

The right windows can make a REAL DIFFERENCE . . .

Ask the teacher!

The teacher sees the effect of good daylighting and good ventilation in a lot of ways. In a classroom filled with fresh air and daylight, her students are more alive and alert—more receptive to learning. There's none of that "closed-in" feeling. And needless to say, the teacher herself feels "more like teaching" in such a room. Fenestra* windows give you *more* daylight per opening because of their slender, but strong steel members.

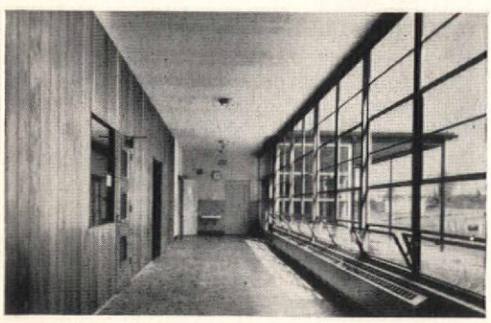
There are practical, as well as psychological, advantages to the right windows. The teacher can operate the vents in Fenestra Intermediate Projected Steel Windows easily. Tilt-in vents protect her students from drafts, and like tilt-out vents, admit fresh air even on rainy days. And sill vents keep even the most rambunctious of small fry from tumbling out the windows.

They'll probably stay cleaner, too, because they can be washed (as well as screened) from the inside—with resultant savings in time, labor and cost. *And they'll never need painting if you specify Fenestra Super Hot-Dip Galvanizing.* It's a special process that protects your windows from rust and weather for life!

For complete information on these beautifully designed steel windows, call your Fenestra representative. He's listed in the yellow pages of your phone book. Ask for our authoritative booklet, called *Better Classroom Daylighting.* Or write Detroit Steel Products Company, Dept. AF-1, 2296 East Grand Boulevard, Detroit 11, Michigan. *®

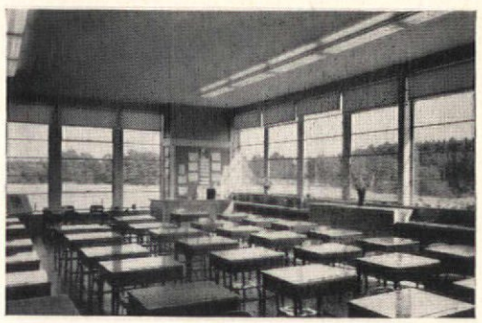
Fenestra | **INTERMEDIATE STEEL WINDOWS**

Architectural, Residential and Industrial Windows • Metal Building Panels
Electrifloor* • Roof Deck • Hollow Metal Swing and Slide Doors



MISSOURI. Fenestra Steel Windows in Willard Elementary School, Willard, Mo. *Architect:* I. Dale Allmon, Springfield, Mo. *Contractor:* DeWitt Construction Co., Springfield, Missouri.

TEXAS. Fenestra Steel Windows in the Science Hall at St. Mary's University, San Antonio, Texas. *Architect:* Julian & White, San Antonio. *Contractor:* Lynn & Morsey, San Antonio, Texas.

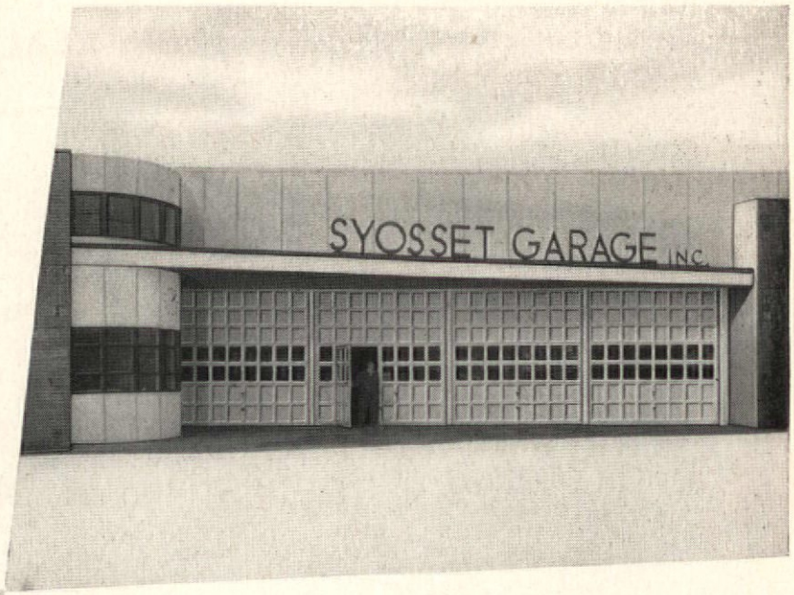


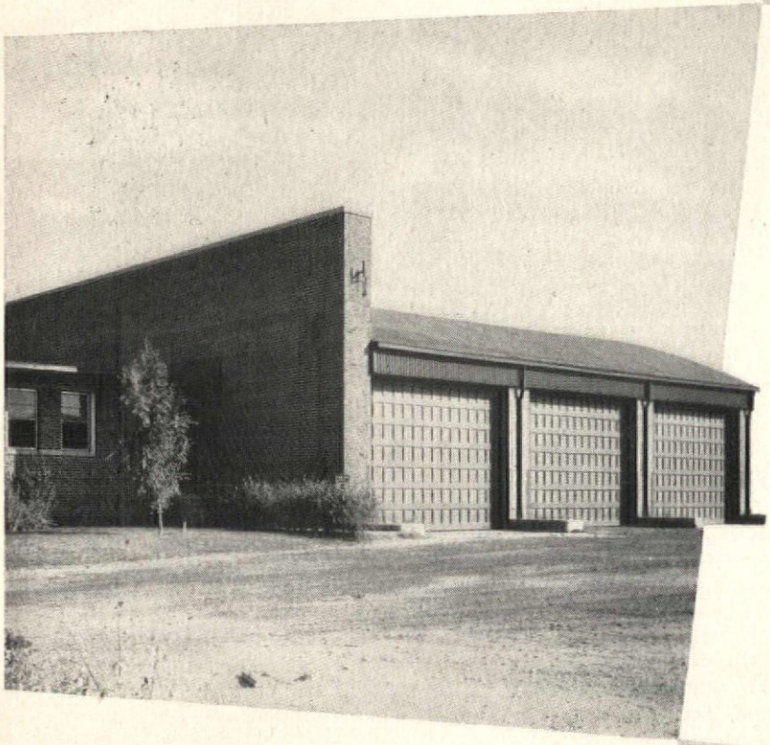
MASSACHUSETTS. Fenestra Steel Windows in the Elementary School at Kingston, Mass. *Architect:* Bogner & Richmond, Cambridge, Mass. *Contractor:* Blake Construction Co., Milton, Massachusetts.

Performance

THAT BACKS YOU UP

...NEVER LETS YOU DOWN





When all's said and done, it's *performance* that counts in overhead type doors for commercial and industrial applications. And that's exactly what you can count on with Ro-Way Overhead Type Doors.

The smooth, easy, dependable performance that results from properly engineered design, exclusive features, top quality materials, rugged construction, and fine workmanship throughout.

For instance—Taper-Tite track and Seal-A-Matic hinges that snug the door against side and head jambs for weather-tight closure; specially designed, friction-reducing track and ball bearing Double-Thick tread steel rollers to assure smooth, quiet, easy-up, easy-down operation; Power-Metered springs individually balanced to the weight of each door for freer, easier door travel.

Selected west coast lumber and heavy gauge hardware.

And rugged construction to take the daily ups and downs in stride. Mortise and tenon joints both glued and steel doweled; muntins, rails and stiles precision squared for precision fit; sections rabbeted for weather-tight joints; millwork both drum and hand sanded for finest finish; hardware both Parkerized and painted for maximum rust prevention.

It all adds up to performance that backs *you* up, never lets you down. Specify Ro-Way — and get what you want and need.

ROWE MANUFACTURING CO. • 950 Holton St., Galesburg, Ill.

there's a Rō-Way *for every Doorway*

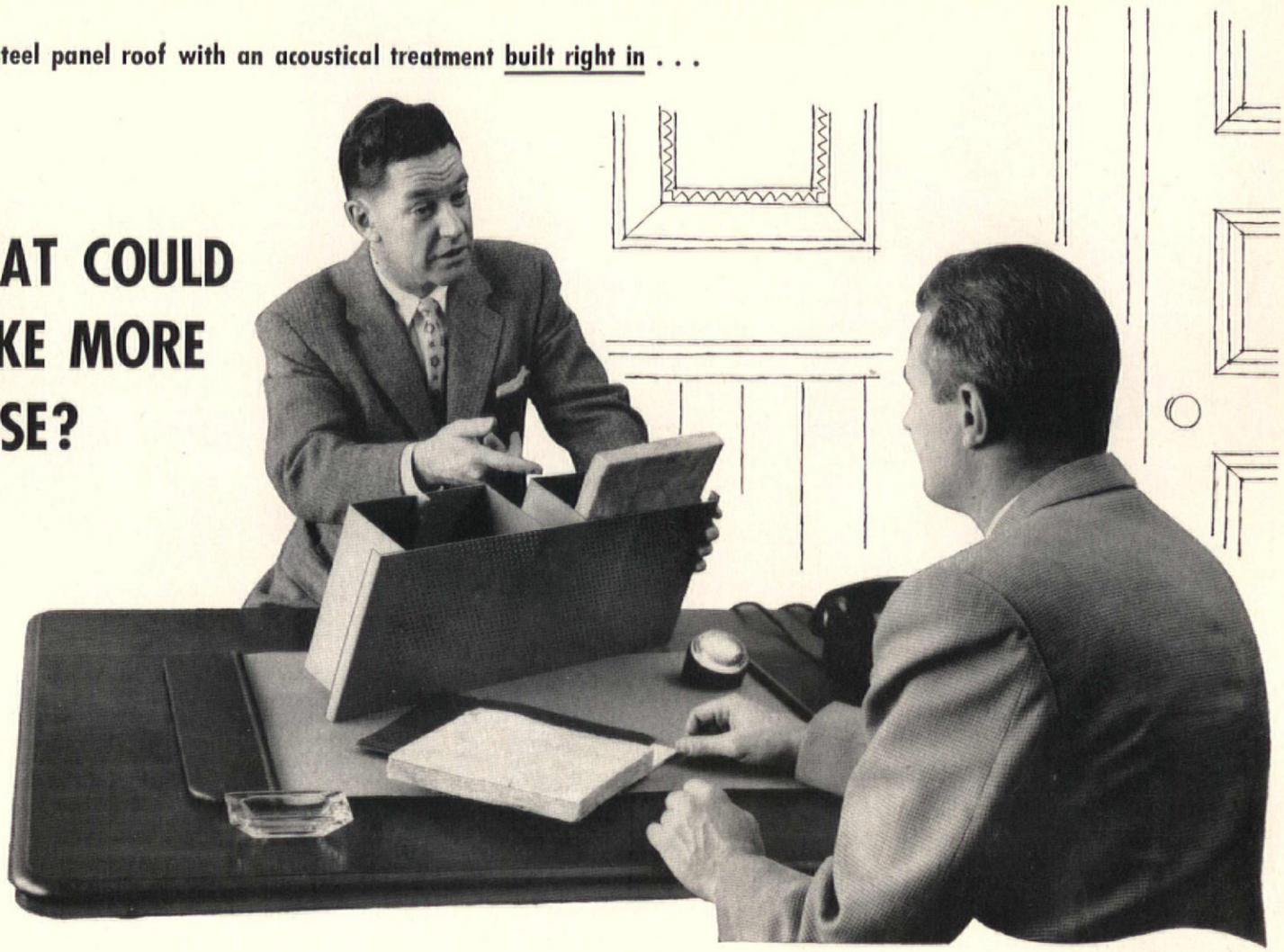
Rō-Way
OVERHEAD TYPE DOORS

Nationwide sales and installation service. See your classified telephone directory for nearest Ro-Way distributor

SEE OUR CATALOG IN SWEET'S

Here's a steel panel roof with an acoustical treatment built right in . . .

WHAT COULD MAKE MORE SENSE?



If you're looking for a really practical acoustical treatment for your new classrooms, gym or auditorium, look no further! For these Fenestra* Acoustical-Structural Building Panels form a beautifully finished structural ceiling, noncombustible acoustical treatment and a joist-system support for finished roofing—*all in one!*

No acoustical material has to be pasted on the ceiling surface. You pay no bills for special trades or extra labor. Maintenance washing or painting won't affect the acoustical efficiency. Bumps or knocks can't hurt this ceiling. And if your building has a second floor, your Fenestra ceiling forms a strong solid subfloor for rooms above.

This combination acoustical-structural ceiling goes up *fast.* The panels lock together simply and quickly, saving days of labor, giving you substantial cost savings. To see how much sense it makes in the building *you're* planning call your Fenestra Representative. And do it *before* your plans are on paper! Or write to Detroit Steel Products Co., Dept. AF-1, 2296 East Grand Blvd., Detroit 11, Mich.

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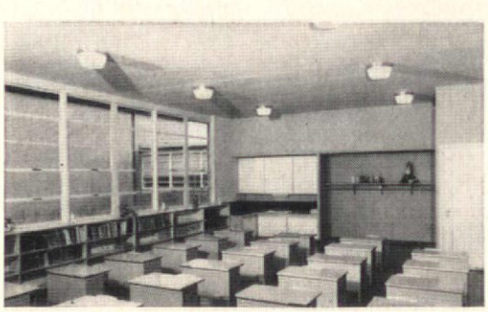
Fenestra | **METAL BUILDING PANELS**

Architectural, Residential and Industrial Windows • Metal Building Panels
Electrifloor† • Hollow Metal Swing and Slide Doors • Roof Deck

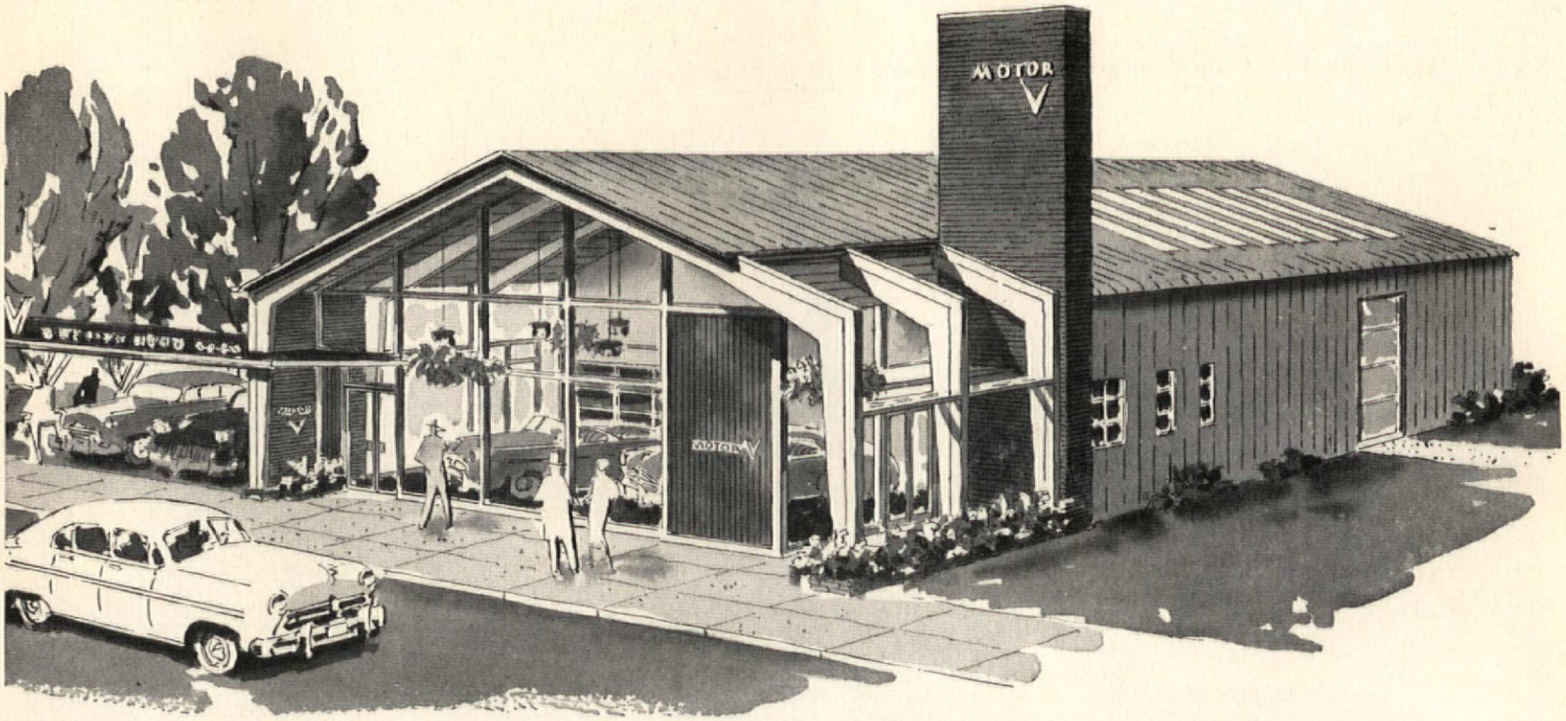
†®

PANELS are laid over the rigid steel frame during course of erection. It's a construction method that can pay you big dividends. Be sure to investigate before you plan your next building!



ACOUSTICAL PANELS in Willard Elementary School, Willard, Mo. *Architect:* I. Dale Allmon, Springfield, Missouri. *Contractor:* DeWitt Construction Co., Springfield, Missouri.

ANOTHER INSTALLATION at Converse County High School, Douglas, Wyoming. *Architect:* Hitchcock & Hitchcock, Laramie, Wyoming. *Contractor:* Speigelberg Lumber & Building Co., Douglas, Wyoming.



Imagination...

and a **BUTLER**

steel building

A modified Butler steel building is not basically different from the United Nations building, or any other example of practical, modern architecture. The structure of the building is steel. Imagination and architectural inventiveness have transformed the cold, skeletal steel framework into a structure of grace and beauty—and permanence.

This is an age of steel—an age when buildings are rightfully expected to have *more* stability, *greater* adaptability, *longer* life than they did in an era of wood, brick and mortar. This is an age of get-your-money's-worth. It is an age for which low-cost, quickly-erected, easily-modified, readily-expanded Butler steel buildings are made to order.

If you would like more information about Butler steel buildings, write to the Butler office nearest you. Ask for the Butler Architect's Brochure—A.I.A. file number 14i. For prompt reply, address office nearest you.

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Manufacturers of Oil Equipment • Steel Buildings • Farm Equipment
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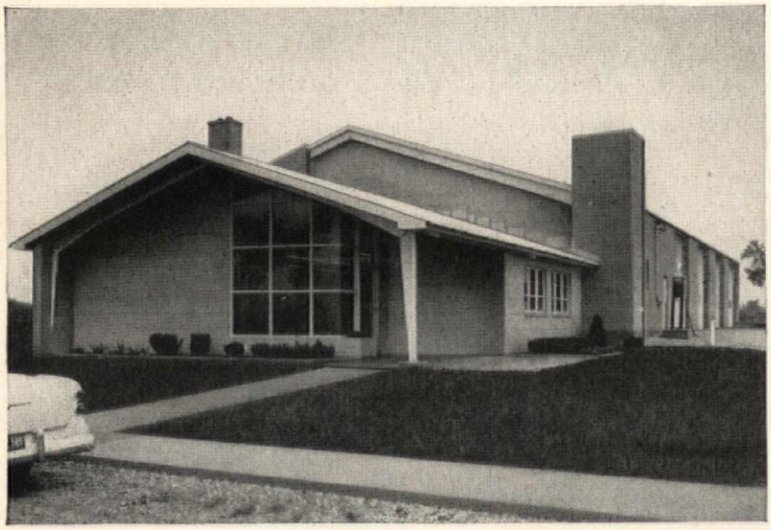
Dept. 36A, Richmond, California



Low-cost office building shows striking modification with brick, glass and paneling. Large areas of glass are possible with no weakening of building, because entire weight is on Butler's rigid-frame.

Spacious clear-span interior of Butler steel building, handsomely and economically modified, provides post-free space for greatest usability, convenient arrangement of office equipment.

SOCONY-VACUUM BUILDING
NEW YORK CITY
Turner Construction Company,
General Contractors
Harrison and Abramovitz,
John B. Peterkin,
Associated Architects
Edward E. Ashley,
Electrical Engineers

the eyes of America are on the new Socony-Vacuum Building

Another complex and highly technical electrical installation entrusted to the proven know-how of Fischbach and Moore.

WHO WE SERVE PROVES HOW WE SERVE.

FISCHBACH AND MOORE

INCORPORATED

ELECTRICAL CONTRACTORS

SINCE 1918

FROM COAST TO COAST ***An organization that has to its credit every conceivable type of electrical installation.***

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ANNOUNCE A GREAT

TO INCREASE YOUR CLIENTS'

"HOME MEANS MORE WITH

WITH THIS COMPLETELY NEW KIND OF ADVERTISING

EXPECTING YOU TO SPECIFY CARPETS IN HOMES,

The unique beauty of carpet is already taken for granted by most of your clients. Now this great advertising campaign will emphasize the *basic need* for carpet, its utility and economy.

Home and building owners by the millions will be convinced, not only that they can afford carpet, but that they actually cannot afford to be without it.

These new, powerful ads, stressing carpet's functional benefits and long-range economy, will appear in the following national magazines: *Life, Saturday Evening Post, American Home, Better Homes and Gardens, House and Garden, House Beautiful, Living for Young Homemakers, Sunset, Bride's Magazine, Parents, McCall's, Woman's Home Companion,*

HERE ARE THE 5 BASIC NEEDS FOR CARPET

1. QUIET— Carpets absorb up to 90% of floor noise. With carpet, homes are more restful, and living becomes more gracious. Carpeted offices increase work-efficiency over offices with noisy, hard surfaced floors.

2. EASY TO CLEAN— Upkeep on carpeted floors is considerably less than upkeep on hard floors. Housewives are spared time and fatigue, and distasteful scrubbing and waxing are no longer necessary. In buildings and institutions, average maintenance savings on carpeted floors is about $3.96 per square yard per year.

3. ECONOMY — Some clients may think of carpets as an expensive luxury. You can show them that good carpet costs

HARDWICK & MAGEE • HIGHTSTOWN • HOLMES • KARASTAN

PHILADELPHIA CARPET • ROXBURY • SANFORD • ALEXANDER SMITH

NEW ADVERTISING PROGRAM ACCEPTANCE OF CARPET

CARPET ON THE FLOOR"

CAMPAIGN, MORE OF YOUR CLIENTS WILL BE OFFICES, STORES, AND PUBLIC BUILDINGS

Ladies' Home Journal, Woman's Day – a total of 210,426,596 messages.

Separate carpet campaigns will be directed toward such special groups as businessmen, hotel and motel owners, institution managers, architects, builders, decorators in the following publications: *Business Week, Institutions, Wall St. Journal, Architectural Forum, Progressive Architecture, Architectural Record, American Builder, Interiors, Interior Design.*

Survey after survey shows that decorators and architects have always preferred carpet above all other types of floor covering. Now, by pointing out new facts about its quiet comfort and long-range economy, the carpet industry will make the client's preference the same as yours.

THAT YOUR CLIENTS WILL BE READING ABOUT

less than they think. Carpet gives long years of economical wear, costs far less to maintain.

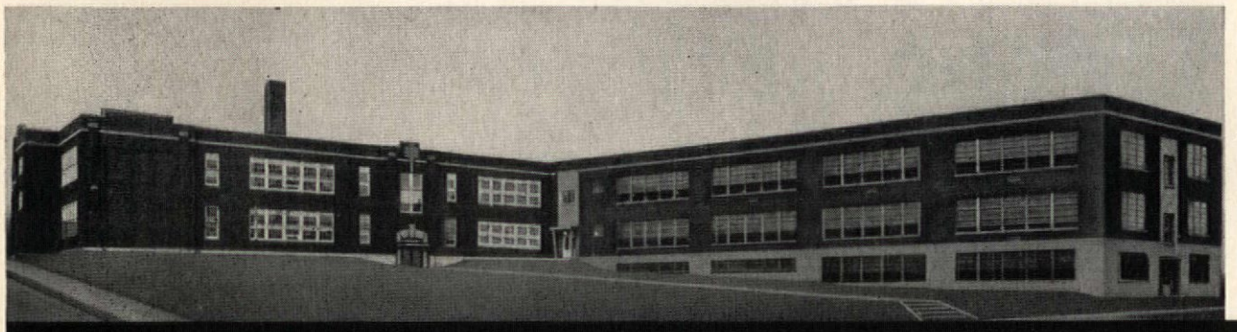
4. COMFORT AND WARMTH – Everyone feels more at ease on carpets than on hard floors. Carpet is easier on the feet, easier on the nerves. Hard-floor fatigue, a common ailment, can be easily remedied by soft comfortable carpet.

5. PRIDE OF OWNERSHIP – The envied beauty of carpet adds a special pride to every homeowner's heart. In business, carpet is an outward sign of success. Salesmen and customers are equally impressed by carpeting for, despite its economy, there is something about carpet that says, "success walks on carpeted floors."

CARPET INSTITUTE, INC., 350 Fifth Avenue, New York 1, N. Y.

Eastern Air Lines
Miami, Florida

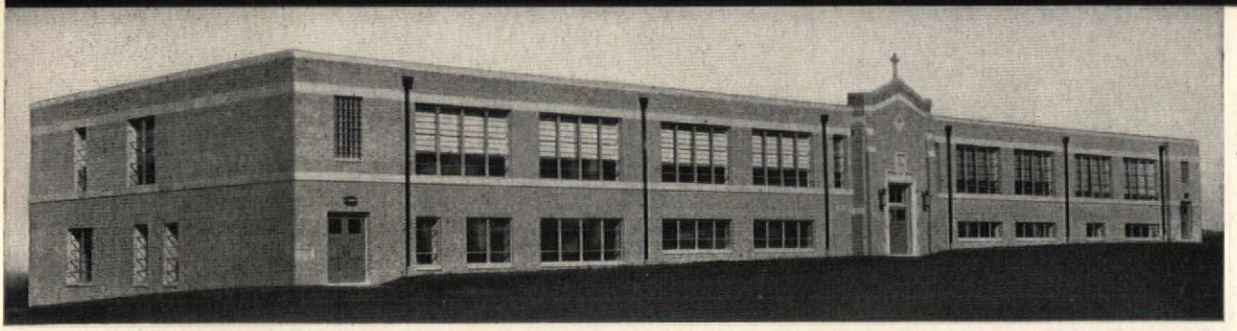
Engineering—Eastern Air Lines Engineering Dept. • Plbg. Whlslr.—A & B Pipe & Supply Company, Miami, Fla. • Plbg. and Heating Cont.—Chas. M. Ewing, Miami, Fla.



Harry L. Johnson School
Johnson City, New York

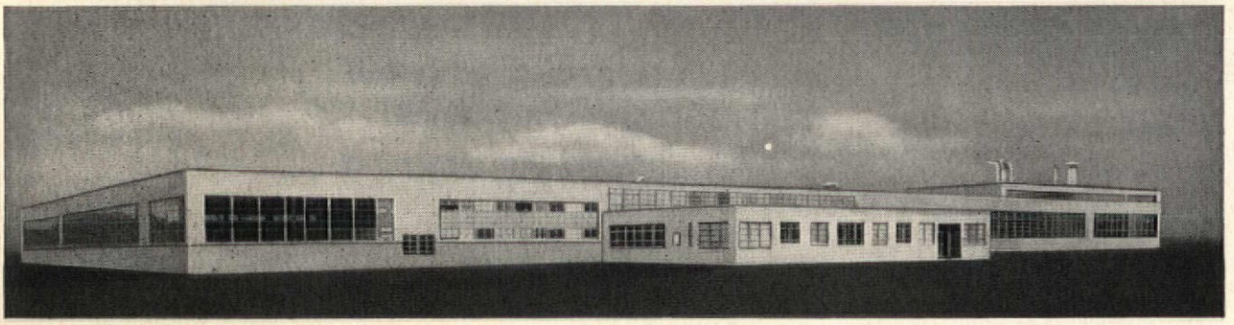
Architect—Conrad and Cummings, Binghamton, New York • Gen. Cont.—Frank W. O'Connell, Inc., Binghamton, N. Y. • Plbg. Whlslr.—Sage Supply Company, Inc., Binghamton, N.Y. • Plbg. Cont.—S. P. Ainslie, Binghamton, New York

Plumbing fixtures that are MORE than "equal"...



St. Mary Magdalen School
Fairfax, Wilmington, Del.

Architect—Gleason & Mulrooney, Philadelphia, Pa. • Gen. Cont.—John E. Healy & Sons, Wilmington • Plbg. Whlslr.—Speakman Company, Wilmington • Plbg. Cont.—Andrew E. Mitchell, Wilmington



Channel Master Corp.
Ellenville, New York

Architect—Lombard Const. & Eng. Co., Youngstown, O. • Plbg. Whlslr.—Steinhoff's Supply Co., Inc., Ellenville, N.Y. • Plbg. Cont.—A. Steinhoff, Ellenville, N.Y.

. . . when you install plumbing fixtures in public restrooms, you've got to be sure they'll stand up under *rough* daily use. That's why so many commercial buildings, industrial plants and institutions install Richmond fixtures—they're MORE than "equal" to that kind of treatment.

When you specify Richmond, you're choosing plumbing fixtures of maximum durability with minimum maintenance—the end products of correct design, careful selection of raw materials and close control in manufacturing operations. Richmond vitreous china ware, for example, is fired in modern kilns at temperatures up to 2300°F. to give you a highly scratch-resistant surface that is actually comparable in hardness and durability to the natural sapphire. In Richmond cast-iron ware you get a ceramic glaze that's furnace-fused to the base for a permanent, impermeable bond and smooth glass-hard surface. Continuous quality control at all stages of manufacture assures the production of only top-grade fixtures.

Richmond fixtures comply with U. S. Government specifications WWP-541A, Federal specifications for land use of Army, Navy and Air Force installations and exceed the requirements of Commercial Standards CS20-49 and CS77-51.

Richmond plumbing fixtures are available in a wide range of sizes and modern styles, in famous "Whiter-White" or seven lovely pastel colors.

For long service life with minimum maintenance, it pays to specify Richmond.

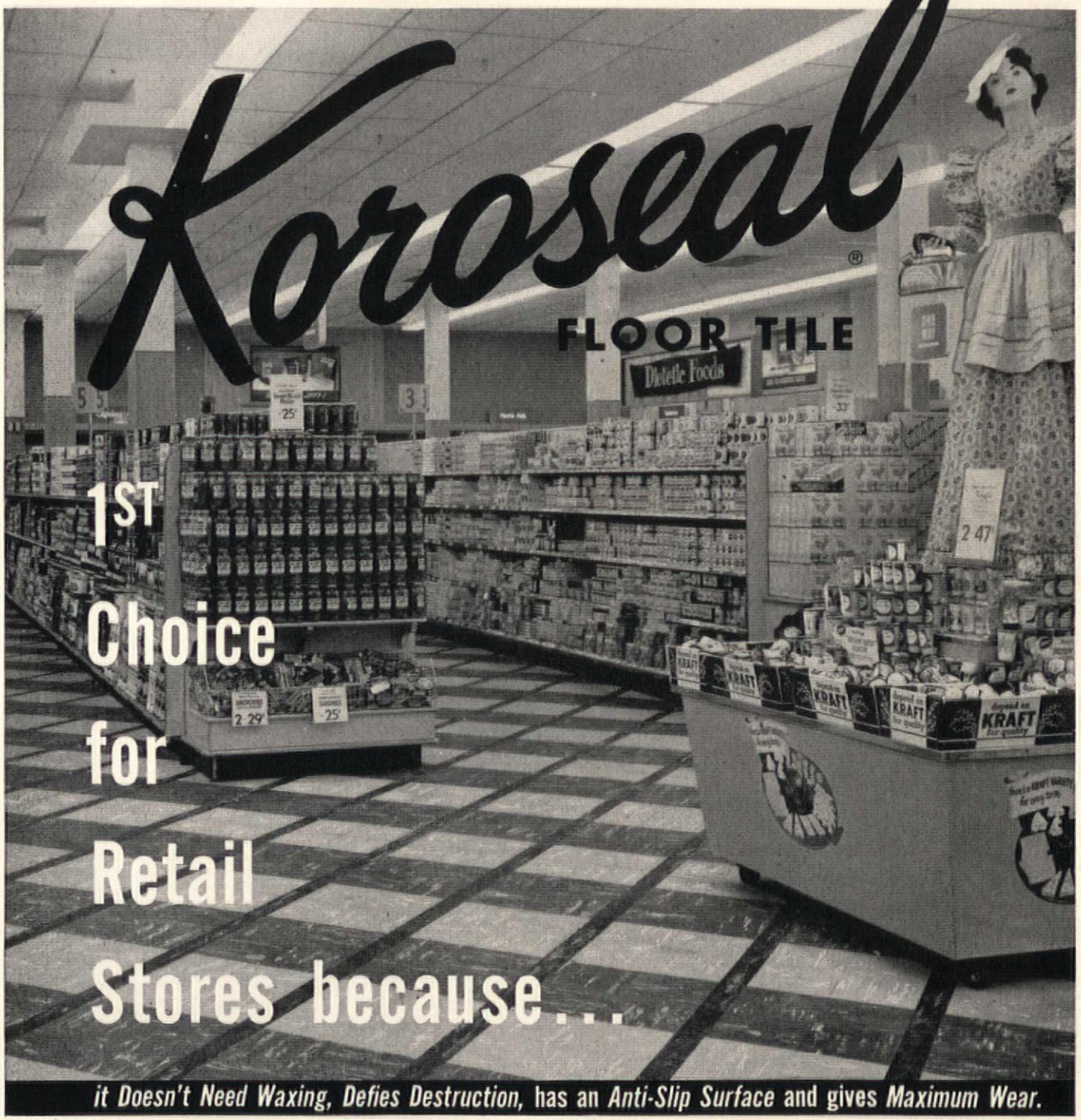
RR RICHMOND
Affiliate of Reynolds Metals Company
PLUMBING HEATING

Sold through selected wholesalers

RICHMOND *radiator company*

Affiliate of Reynolds Metals Company
16 Pearl Street, Metuchen, N. J.

B.F.Goodrich



Free Aids for Architects

Send today for handy B. F. Goodrich *Floor Design Folder* — shows how to make floor designs that direct traffic, draw attention to specific areas, create an atmosphere of spaciousness, etc. Also illustrates 30 different floor patterns in full color.

See Sweet's for specifications

B. F. Goodrich Co.
Dept. AF1, Flooring Division
Watertown 72, Mass.

Gentlemen: Please send me your free B. F. Goodrich *Floor Design Folder* and *Color Guide.*

Name.....

Firm.....

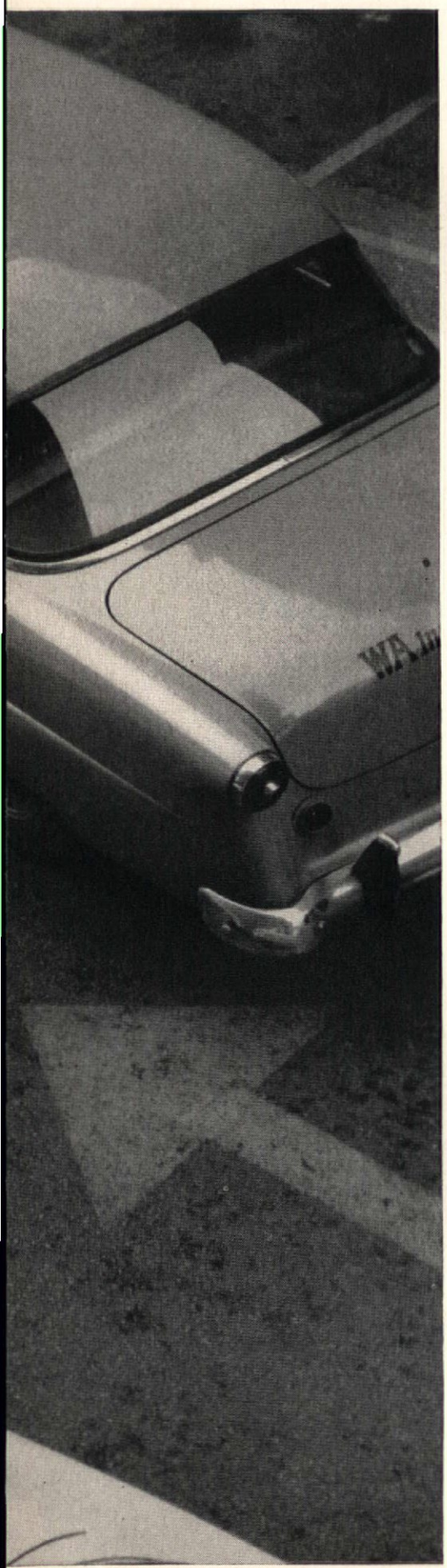
Street.....

City.....*Zone*....*State*.....

RUBBER TILE • ASPHALT TILE • KOROSEAL TILE • RUBBER COVE BASE • ACCESSORIES

Keep your client's employees

out of the traffic stream !



This illustration is not exaggerated when you think of working conditions in thousands of offices which do not use partitioning for privacy and efficiency.

To help you give your clients more productive, livable offices at the lowest cost, Virginia Metal Products does this:

1. VMP sells the advantages of properly designed working areas.

For example, VMP offers *ratio-delay studies* which accurately rate office efficiency. These reports are before-and-after studies of firms who have installed VMP MOBILWALLS to eliminate their traffic stream problems.

A recent study for a radio-tv representative who installed VIRGINIA METAL PRODUCTS MOBILWALLS shows that—

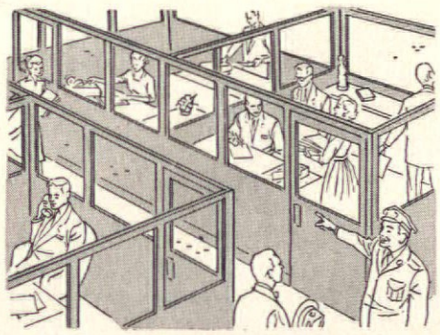
- **Office Productivity increased 30%**
- **Delays and Lost Motion were cut 58%**
- **Time devoted to Distractions and Correction of resulting Errors was cut 55%**
- **The VMP MOBILWALL installation added as much to the work output of the office as could have been added by a 30% increase in employees and payroll !**

These studies are available for your use.

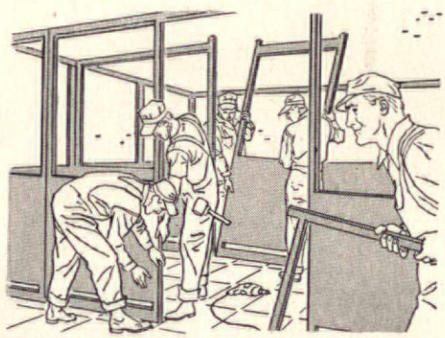
2. VMP works with you to improve the quality and service on VMP MOBILWALLS.

VMP *is a can-do company*. Our sales representatives and factory engineers make your sales and design problems their problems. Their purpose is to give you more help, more experience, more skill in the handling of your specifications.

. . . and do it best with metal, movable VMP MOBILWALLS



3. VMP MOBILWALLS have modern styling for executive and clerical offices. They fit perfectly and are expertly finished. Colors are restful and permanent. Surfaces never chip, warp or crack—are washed clean with soap and water. Because they are metal, with many distinctive locking features, VMP MOBILWALLS can be moved at anytime to suit changes in floor plans.



4. INSTALLATION TAKES A FEW HOURS, with skilled erection crews part of VMP's service. Working out of nearby warehouses, VMP crews save your time and the client's money. You get exactly what VMP engineering originally promised to deliver . . . the best solution to designing more productive, livable offices . . . solved permanently with metal, movable VMP MOBILWALLS !

Interested ? Write to Dept. AF-1 for complete, illustrated literature.

Virginia Metal Products, inc.

ORANGE, VIRGINIA

Subsidiary of Chesapeake Industries, Inc.

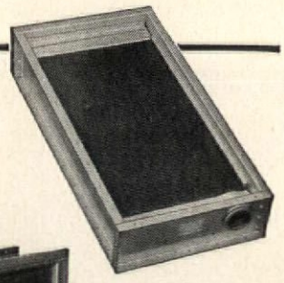
You're Invited to the

YOUNG RADIATOR COMPANY BOOTH 931

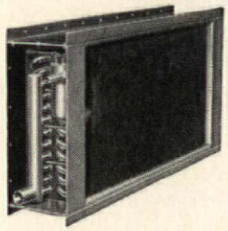
AT THE 12TH INTERNATIONAL HEATING & VENTILATING EXPOSITION • PHILADELPHIA, PA. • JANUARY 24-28

A pleasant way to start your "show tour" is to visit the Young Radiator Company booth No. 931. You'll be mighty welcome and our specialists will be on hand to answer all your questions about Young Heating, Ventilating and Air Conditioning Products . . . both established and new. Illustrated here are a few of the outstanding Young Products which will be exhibited. Stop in . . . we'll be expecting you.

COILS

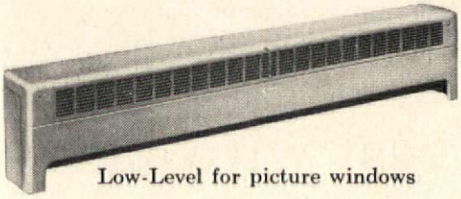


Heating Coils

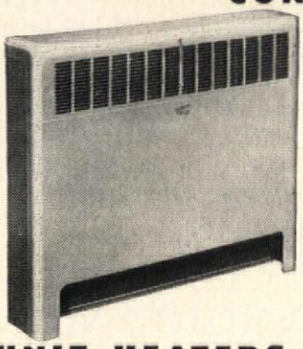


Cooling Coils

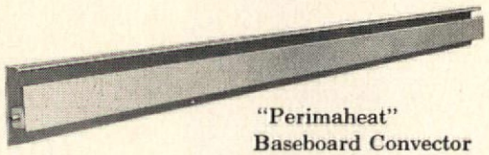
CONVECTORS



Low-Level for picture windows

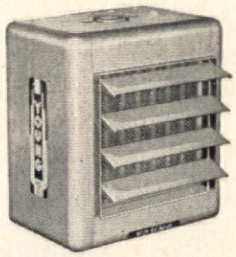


Standard free-standing, wall-hung, semi-recessed and fully-recessed types.

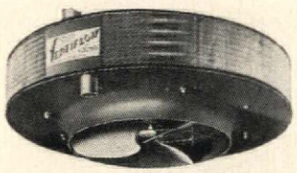


"Perimaheat" Baseboard Convector

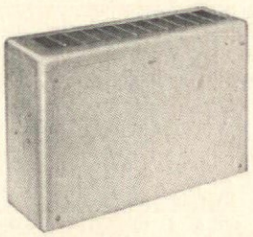
UNIT HEATERS



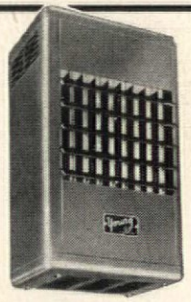
Horizontal Discharge type



Vertical Discharge type

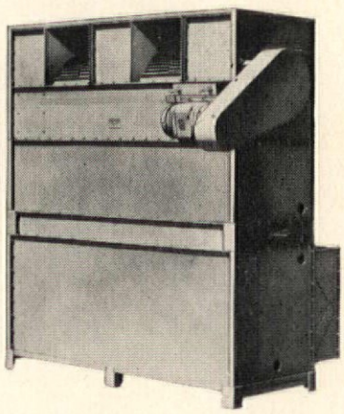


Cabinet type



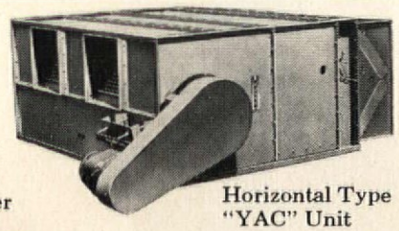
Gas Fired Horizontal type

AIR CONDITIONING UNITS



Vertical Type "YAC" Unit

Remote Type "Roomaire" Conditioner



Horizontal Type "YAC" Unit

Young RADIATOR COMPANY

RACINE, WISCONSIN

Creative HEAT TRANSFER ENGINEERS FOR INDUSTRY

Heat Transfer Products for Automotive and Industrial Applications.

Heating, Cooling, Air Conditioning Products for Home and Industry.

Executive Office: Racine, Wisconsin, Plants at Racine, Wisconsin, Mattoon, Illinois

Contractors:
O'Brien & Fortin, Inc.
New York City

Architects:
D. Everett Ward
Dwight James Baum
Otto Eggers
New York City

In **1940**
Lehigh Mortar Cement was used in the construction of the

A*merican*
I*nstitute of*
A*rchitects'*

Administration & Library Building in Washington, D. C.

Lehigh meets the most rigid mortar standards.

U.S. Government Specification SS-C-181c, Type I and Type II.

ASTM Specification C 91—53, Type I and Type II, which includes the autoclave test for soundness.

TODAY—The clean, weathertight walls of this attractive building show the results of good design, good workmanship, and good materials.

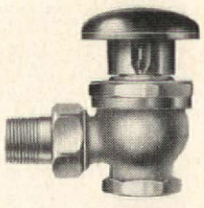
LEHIGH
PORTLAND CEMENT CO.
Allentown, Pa.

LEHIGH PORTLAND CEMENT
LEHIGH MORTAR CEMENT
LEHIGH EARLY STRENGTH CEMENT
LEHIGH AIR-ENTRAINING CEMENTS

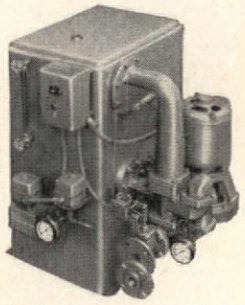
Announcing . . . new Dunham Thermo

New Thermo Vector painted to simulate wood paneling in office of Mathias Klein, President, Mathias Klein & Sons, Chicago, Ill.

From radiator traps
to fully engineered systems
you can DEPEND ON DUNHAM for
everything you need in heating

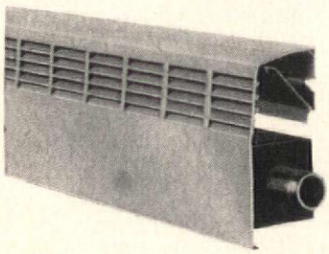


Dunham Radiator Valves. Complete line of radiator valves, traps and other specialties for steam heating.

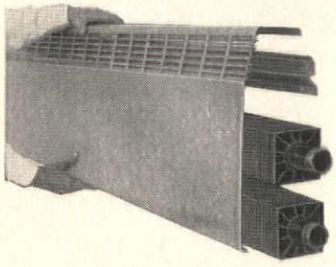


Dunham Vacuum Heating Pumps. Single and Duplex models. No close clearance parts. Only one moving element.

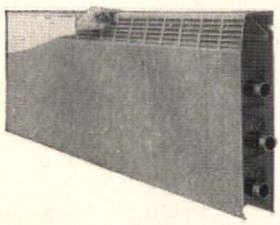
Vector along-the-wall radiation



Here you see the tailored, trim lines of new Thermo Vector.



Here you see how easily new Thermo Vector is installed using "hanging strip."



Here you see the lever-operated damper installed in three tier Thermo Vector.

—with a tailored, trim look

New Dunham Thermo Vector looks good ANYWHERE! Its smooth, unbroken horizontal lines blend beautifully in any office or commercial building . . . and Thermo Vector is sturdy enough to stand up for years and still look good in any industrial or institutional installation.

—with "built-in" versatility

New Dunham Thermo Vector is used flush mounted along the walls . . . one, two or three tiers high . . . with steam or hot water . . . steel or nonferrous elements. Use with full back or just use "hanging strip." Front outlet grille eliminates wall smudging—lets you install Thermo Vector ANYWHERE.

—with cost-cutting ease of installation

To install Dunham Thermo Vector, all you do is position the back or "hanging strip" on wall. Attach element support to it and hang elements. Mount one-piece cabinet . . . then accessories which conceal elements and piping for the "finishing touches." Fronts, backs and lever-operated damper easily cut on the job.

For further information, write for Bulletin AF-1, C. A. Dunham Company, 400 W. Madison St., Chicago 6, Ill.

DUNHAM®

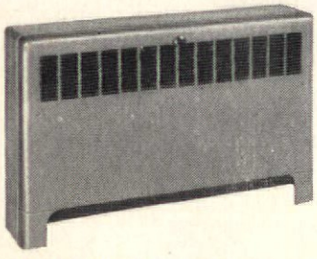
THERMO VECTOR RADIATION

TRADE-MARK

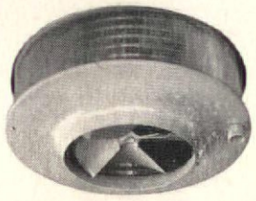
RADIATION • CONTROLS • UNIT HEATERS • PUMPS • SPECIALTIES

Quality First for Fifty-One Years

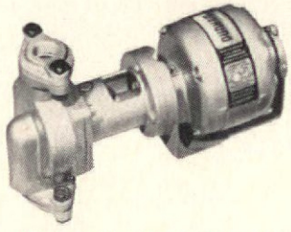
C. A. DUNHAM COMPANY • CHICAGO • TORONTO • LONDON



Dunham Radiation. Full range of sizes and types of convectors, baseboard and finned tube radiation.



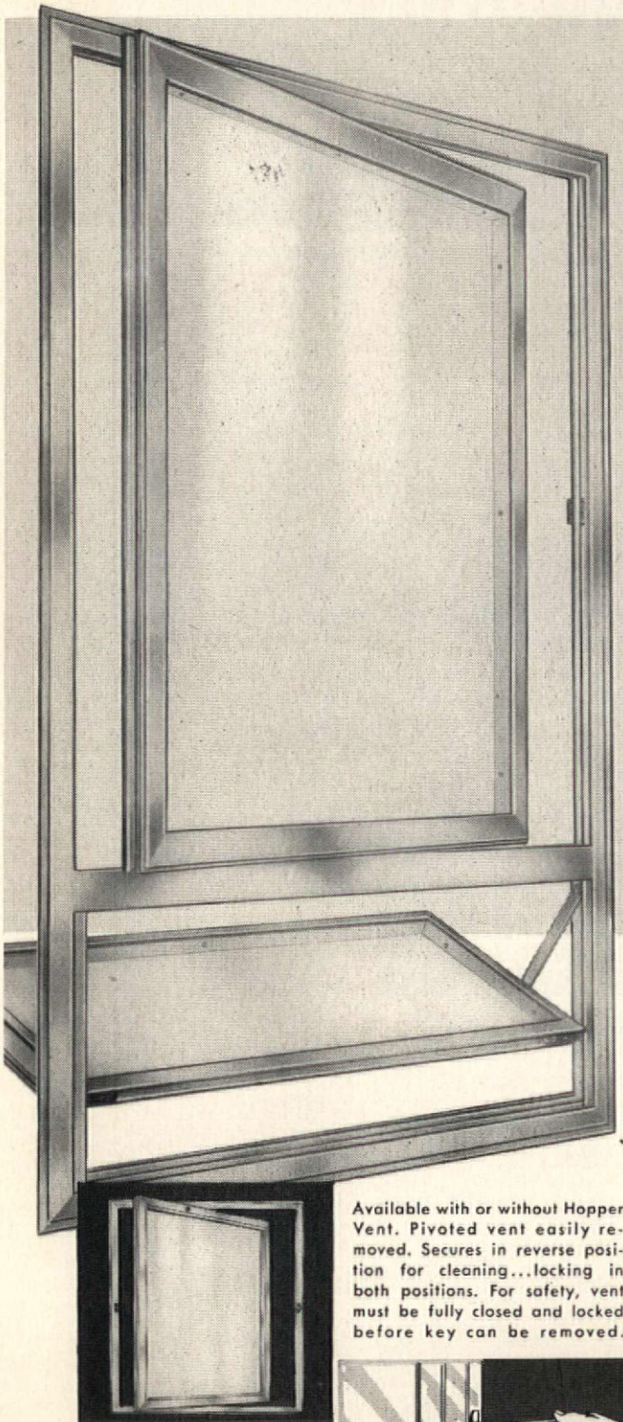
Dunham Unit Heaters. Line includes heating-cooling units, vertical, horizontal discharge and large blower unit heaters.



Dunham Circulators. Heart of Dunham's complete hot water line. Single-spring motor coupling. Brand-name motor.

Dunham Vari-Vac®. Precision temperature control system uses continuous-flow "cool" steam, cuts fuel costs up to 40%.

For modern multi-story buildings...



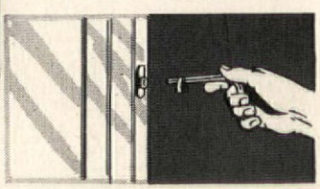
REYNOLDS 100 SERIES

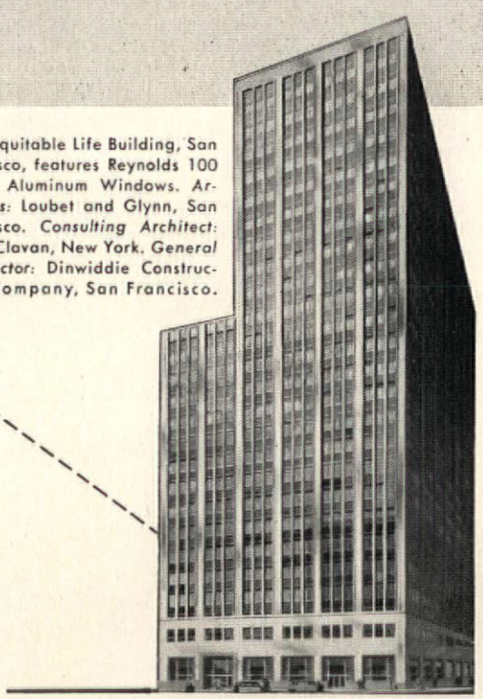
Vertically pivoted

ALUMINUM WINDOWS

This window meets both the design requirements and the special functional needs of today's multi-story buildings. It provides the minimum air infiltration important in air conditioning, and the positive locking essential to safety. Yet this airtight window is easily opened for washing entirely from the inside. Special jamb design accurately positions window in fully closed and washing positions. All-welded frame construction has self-draining feature. Manufactured to architect's size requirements. Write for catalog. **Reynolds Metals Company,** Window Division, 2020 South Ninth Street, Louisville 1, Kentucky.

Available with or without Hopper Vent. Pivoted vent easily removed. Secures in reverse position for cleaning...locking in both positions. For safety, vent must be fully closed and locked before key can be removed.





New Equitable Life Building, San Francisco, features Reynolds 100 Series Aluminum Windows. *Architects:* Loubet and Glynn, San Francisco. *Consulting Architect:* Irwin Clavan, New York. *General Contractor:* Dinwiddie Construction Company, San Francisco.

REYNOLDS ALUMINUM

BUILDING PRODUCTS

SEE "MISTER PEEPERS," starring Wally Cox, Sundays, NBC-TV Network.

Ford Motor Company, Central Staff Office Building
Architects: Skidmore, Owings & Merrill, New York, Chicago, San Francisco
General Contractors: Bryant & Detwiler Co., Detroit

Hollow Metal *at its best*

- ★ **Hollow Metal Doors & Frames**
  Elevator Entrances
- ★ **Convector Enclosures**
- ★ **Metal Base & Trim**
  Metal Wainscoting & Wall Linings
  Custom Partitions
  Stall Partitions & Cubicles
- ★ **Stainless Steel Specialties**
  Hollow Metal Specialties
  Special Hollow Metal Lockers

Once again, SUPERIOR FIREPROOF DOOR & SASH COMPANY, INC., has been chosen to furnish the "HOLLOW METAL" for an outstanding project.

This time, THE FORD CENTRAL STAFF BUILDING.

Doors and frames constitute only a portion of "HOLLOW METAL."

HOLLOW METAL is the mark of a trade that has the ability to coordinate and fabricate many related sheet steel products.

It is not an afterthought of manufacturing a few more items. Rather it is the experience of having made these specific related products over a long period of time.

Thirty-five years of experience in manufacturing "HOLLOW METAL" has given us the ability to combine planning and production with economy into a service for the construction industry.

As Hollow Metal Men, we are proud to have provided the products starred (★) for Ford's New Central Staff Building.

Superior FIREPROOF DOOR & SASH CO., INC.

EXECUTIVE OFFICES: 4175 PARK AVENUE, NEW YORK 57, N. Y. • **PLANTS:** NEW YORK AND SCRANTON, PA.

Walter Kelly, A.I.A., specifies MOEN

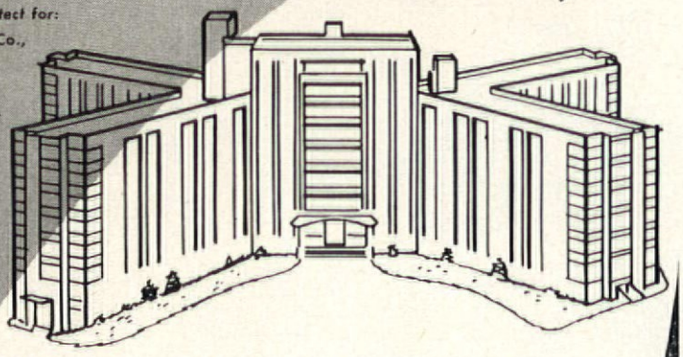
WALTER KELLY, A.I.A., specified MOEN faucets for Willamette View Manor Apartments, Portland, Ore.

"We decided on MOEN single handle mixing faucets because of their modern, functional design, simplicity of operation (finger tip control of both volume and pressure with a single lever), high quality materials and extremely low maintenance due to complete interchangeability of parts in all models. Installation is simplified in back-to-back situations avoiding cross piping.

Another important factor is that MOEN works with the water pressure, not against it, as in conventional types."

Walter E. Kelly

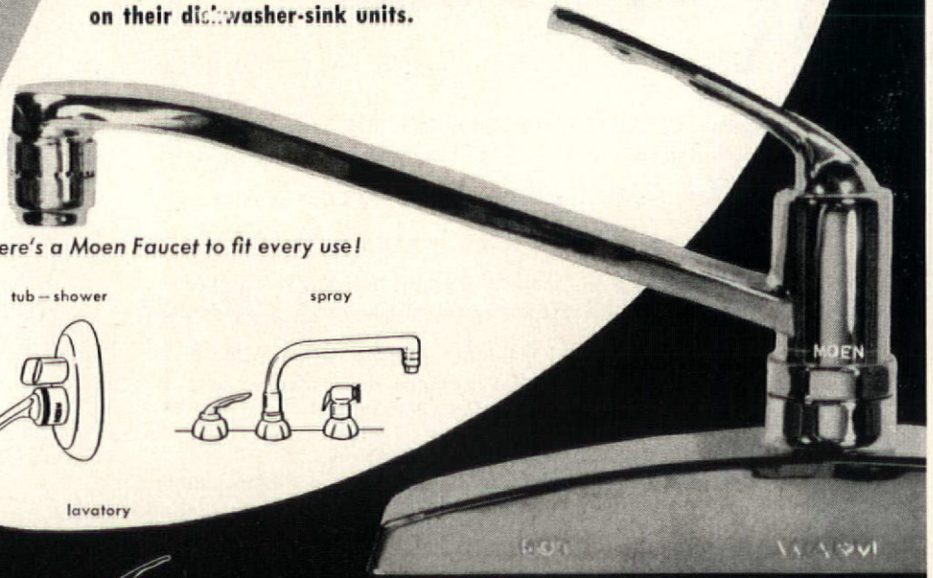
WALTER E. KELLY, A.I.A.—*Architect for:*
Highland Park Plant, Ford Motor Co., (Drafting and Engineering)
Ford Home, Dearborn Mich.
River Rouge Plant, Ford Motor Co.
Specialist in churches, hospitals and commercial construction
(Designer of approximately 50 churches)



MOEN FAUCETS... *Proven for over 10 years*

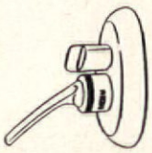
- Most modern of all plumbing fixtures
- Single handle control of volume and temperature
- Finest quality materials in plumbing fixtures
- Drip-proof, pressure sealed valve
- Reduces cost on back-to-back installations—eliminates cross-piping
- Lower maintenance costs—all parts of all models interchangeable

Hotpoint and General Electric have used MOEN exclusively for years on their dishwasher-sink units.



There's a Moen Faucet to fit every use!

tub—shower



spray

lavatory

MOEN VALVE COMPANY
6518 Ravenna Avenue • Seattle 5, Washington

THE ORIGINAL SINGLE HANDLE MIXING FAUCET

DATES

American Road Builders Assn., annual convention, **Jan. 10-13,** Hotel Roosevelt, New Orleans, La.

Solar Energy, a world symposium on applied solar energy, sponsored by the Stanford Research Institute, Stanford Calif., **Jan. 12-15,** Westward Ho Hotel, Phoenix, Ariz.

American Society of Heating & Ventilating Engineers, annual convention, **Jan. 24-27,** Benjamin Franklin and Bellevue-Stratford Hotels, Philadelphia.

Heating and Ventilating Exposition, Jan. 24-28, Commercial Museum and Convention Hall, Philadelphia.

Society of Industrial Realtors, first of three national meetings, **Jan. 26-28,** Shamrock Hotel, Houston, Tex.

Mason Contractors Association of America, annual convention and exhibition, **Jan. 30–Feb. 2,** Jefferson Hotel, St. Louis, Mo.

American Institute of Electrical Engineers, winter general meeting, **Jan. 31–Feb. 4,** Statler Hotel, N.Y.

Industrial Ventilation Conference, Feb. 14-17, Michigan State College, East Lansing, Mich.

American Concrete Institute, 51st annual convention, **Feb. 21-24,** Hotel Schroeder, Milwaukee.

Conference on Church Architecture, sponsored by the Church Architectural Guild of America and the Council of Churches' Bureau of Architecture, **Feb. 23-25,** Netherlands Plaza Hotel, Cincinnati.

American Association of School Administrators will hold three regional conventions this year in lieu of one national meeting: **Feb. 26–Mar. 2,** St. Louis; **Mar. 12-16,** Denver; **April 2-6,** Cleveland. Each convention will feature an architectural exhibit.

Associated General Contractors, 36th annual convention, **March 14-17,** New Orleans.

American Institute of Planners, annual meeting, **March 30–April 2,** Muehlebach Hotel, Kansas City, Mo.

World Plastics Fair and Trade Exposition, including exhibit of building materials, **April 6-10,** National Guard Armory, Exposition Park, Los Angeles.

Building Officials Conference of America, annual meeting, **April 18-21,** Milwaukee.

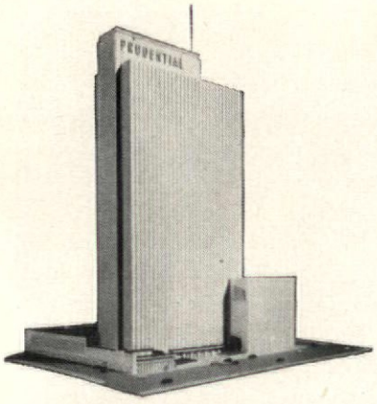
Western Mountain District, American Institute of Architects, regional meeting, **April 28-30,** Camelback Inn, Phoenix, Ariz.

Honeywell Electronics will save thousands of dollars in the world's most modern building

Model of the Mid-America Home Office of The Prudential Insurance Company of America now under construction in Chi. Architects and Engineers: Naess & Murphy, Chi. Gen. Contractor: George A. Fuller Co.; Air Conditioning and Refrigeration Contractor: William A. Pope Co.; Heating Contractor: H. P. Reger & Co.; Ventilating Contractors: R. B. Hayward Co. and Jamar-Olmen Co.; Electrical Contractors: Fischbach, Moore and Morrissey, Inc., Emerson-Comstock Co. Inc., J. Livingston & Co.; Air Conditioning by Carrier Corporation. Rental Agent: L. J. Sheridan & Co., Chicago.

Continued from preceding page

Honeywell Electronic Air means impressive



Without Honeywell Electronic Control

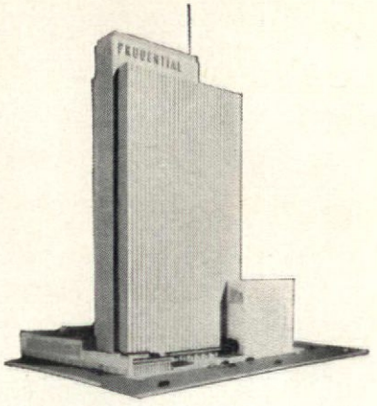
203

CHECK POINTS

203 points would have to be checked and adjusted at the individual control sites.

Electronic Controls will save thousands of dollars

Heart of the electronic master control system will be a basement control panel. From this one location a trained operator can read and adjust the setting of 203 master electronic thermostats—all *remotely*. These thermostats will be located on the water, primary air, cooling and heating systems. It is estimated the integration of the control system with the electronic controls and panels will eliminate 2 degrees of overheating, 2 degrees of overcooling and make checking, calibrating and maintenance easier, simpler, and considerably less expensive. This will make possible an annual saving of thousands of dollars in maintenance and operation.



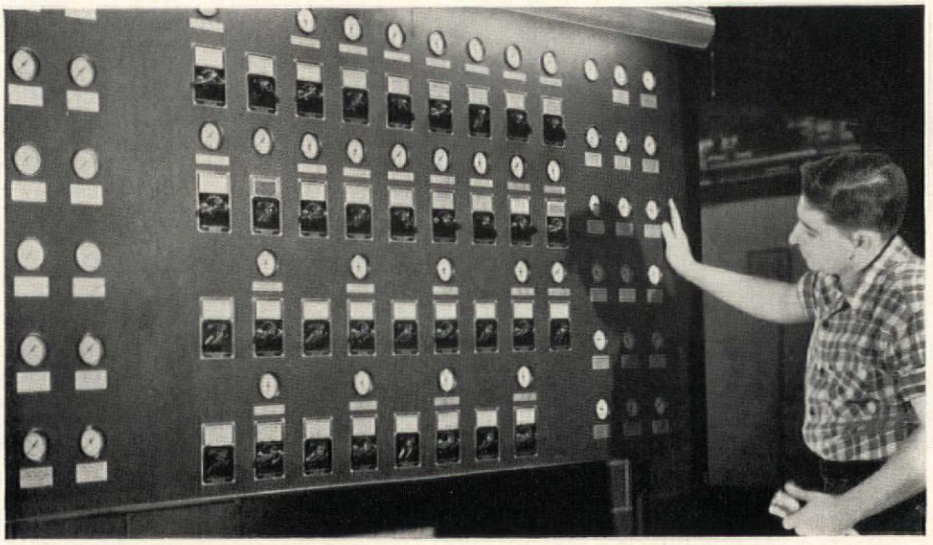
With Honeywell Electronic Control

1

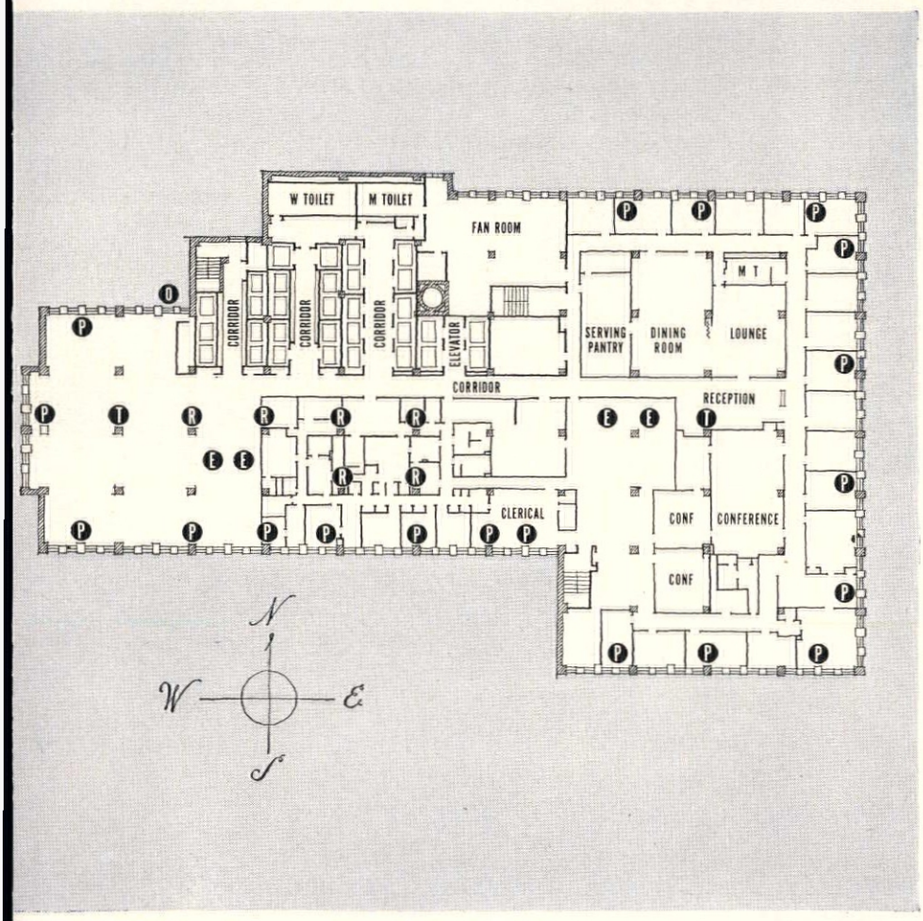
CHECK POINT

An operator at a panel in the basement will be able to check and *adjust* all 203 stats remotely.

From a single control panel in the basement (a typical panel is shown here), an operator will check and *adjust* the indoor weather throughout the huge building. He'll do it by pushing a button to check, and moving a knob if adjustment is necessary. Development of electronic controls has made this scientific control possible. Only from Honeywell can you obtain the electronic controls and the degree of instrumentation to provide such performance.



Conditioning Control economy of performance, maintenance



T ELECTRONIC INDICATION
P PNEUMATIC UNIT THERMOSTAT
E ELECTRONIC DUCT THERMOSTAT
R ELECTRIC ROOM THERMOSTAT
O OUTDOOR ANTICIPATOR

Strategic location of thermostats is indicated by the letters on the floor plan. "E" stands for electronic, "P" for pneumatic, "R" for electric and "T" for electronic indicating thermostat.

The function of the electronic controls is explained on the left hand page.

The pneumatic *room* thermostats you see here will guard comfort in individual offices around the perimeter of the building. The electric thermostats will control temperature in inner offices. The electronic indicating thermostats will be connected to the basement control panel.

OFFICE BUILDING comfort and efficiency will come of age—*electronic age*—when the huge new Mid-America Home Office building of The Prudential Insurance Company of America is completed in Chicago.

For super-sensitive electronic air conditioning controls will mastermind the ideal indoor weather to be provided throughout the building by Honeywell Customized Temperature Control.

These electronic controls, developed by Honeywell after years of research and testing, are far more sensitive than ordinary controls. Yet they're far simpler in construction, have no moving parts to get out of order.

Over a period of just a few years, electronic master controls in the Prudential building will pay for themselves—at an estimated yearly rate of saving of 27% of the original cost. How this saving will be made is explained at left.

As in every building with Honeywell Customized Temperature Control, all controls in the Prudential building will be part of an integrated system.

All thermostats will play an important role in combatting use and occupancy comfort problems.

Another function these strategically placed thermostats will easily handle is exposure compensation. If the wind from Lake Michigan to the east is strong and cold, thermostats on that side will call for more heat. And when the summer sun beats down on the south face of the building, thermostats *there* will call for more cooling.

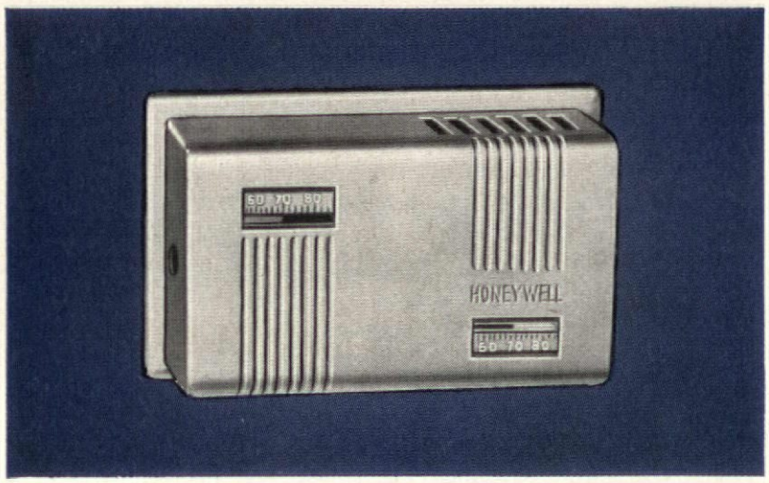
Of greatest significance, however, to the future of comfort controls in the buildings of America is the *electronic* phase of the Prudential installation. It will set the pattern for years to come.

The Electronic Temperature Control story of the new Prudential building continues on the next page

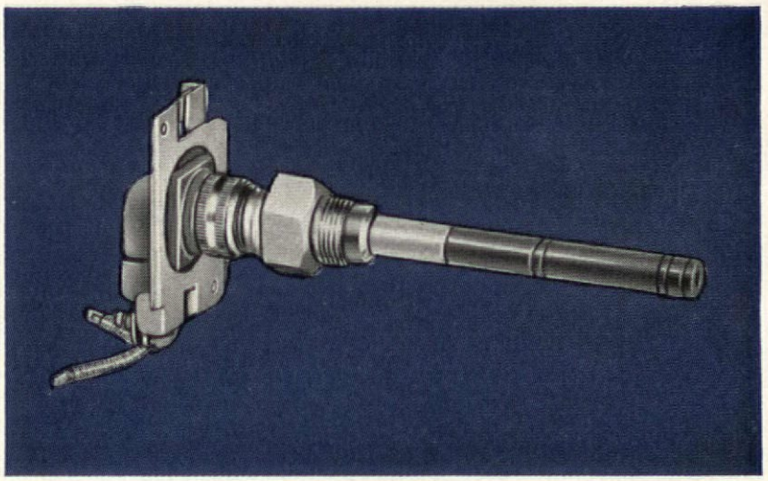
Continued from preceding page

Honeywell Electronic Air Conditioning Control for the new Prudential building in Chicago

Here are the thermostats that will be used



Room Thermostat. This is the famous Honeywell Pneumatic Grad-U-Stat. It will control both heating and cooling in rooms of the 41-story Prudential building. Visible on the wall, it will allow tenants and employees to adjust the temperature to meet particular *room* conditions. To see how these thermostats will be located, refer to the floor plan on the preceding pages.



Electronic Thermostat. This is the electronic thermostat that will be used in the Prudential building. Two-hundred seventy-six will be installed in the master control system. Of this number, 203 will be *adjustable from the control panel.* These stats—which will be located inside duct work, and therefore not seen by tenants—are ⅓ the size of conventional stats, yet are many times more sensitive.

For the finest, most modern temperature control in new or existing buildings—of any size—use Honeywell Electronic Temperature Control

Whether it's an office building, shopping center, factory, motel, hospital, school—or any size building—new or existing, Honeywell Electronic Temperature Control can help you give your clients the finest, most up-to-date control in the world. This includes control of heating, ventilating, air conditioning and industrial processes.

Your clients will not only enjoy more comfort and efficiency, they'll save fuel, too.

For full facts on Honeywell Electronic Temperature Control, call your local Honeywell office.

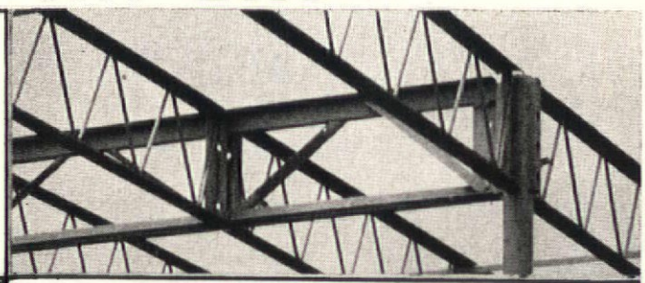
MINNEAPOLIS
Honeywell

Electronic Controls

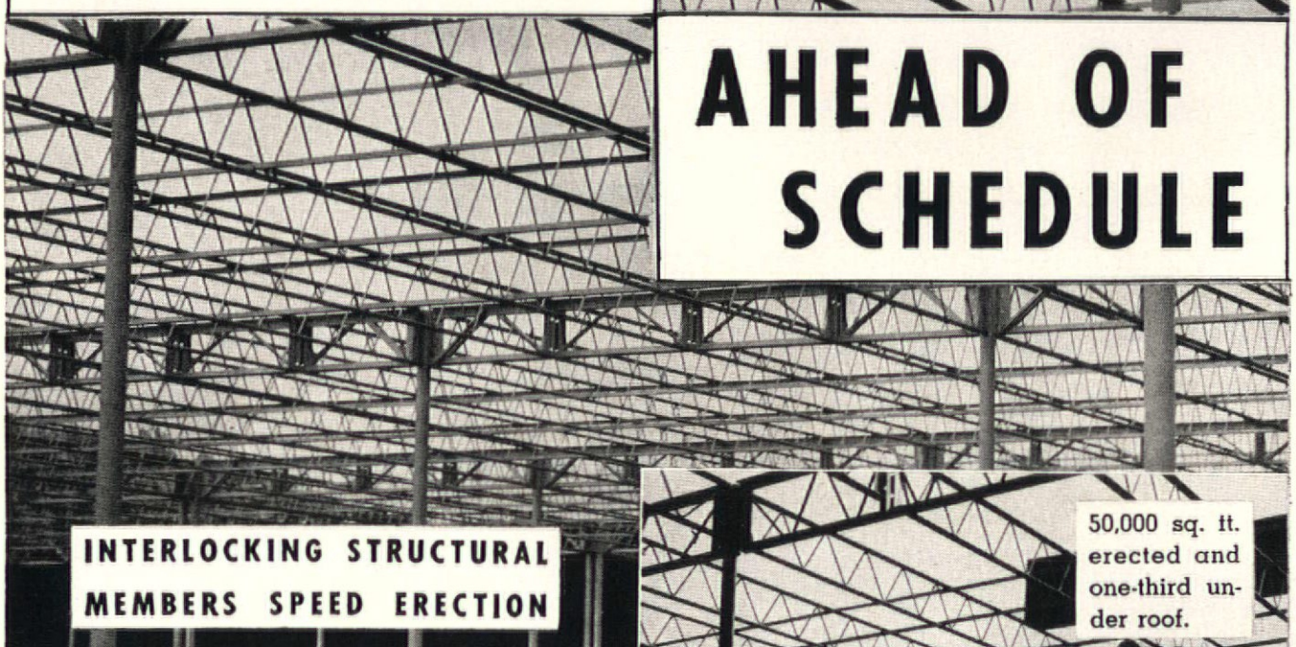
112 OFFICES ACROSS THE NATION

THE *MEANS* TO AN *END*

V-LOK
STEEL FRAMING



AHEAD OF SCHEDULE



V-LOK is an ENGINEER'S ANSWER to many structural design problems — like the average school job for example where the frame is up and roofed in — ready for crafts to move in — in about three days. V-LOK fits smoothly into dimension, load and span requirements whether you have a school, supermarket, warehouse, factory or commercial structure of any kind.

For the bid that wins and an all-time record for your General Contractor — V-LOK is your practical answer.

A coast-to-coast experience record awaits your V-LOK inquiry. Dimensions and loading information will be appreciated.

ORIGINATORS OF THE *OPEN WEB STEEL JOIST*

STANDARDIZED STEEL BUILDING PRODUCTS

V BAR JOISTS • LONGSPANS STEEL TRUSSES • STEEL DECK

MACOMBER INCORPORATED

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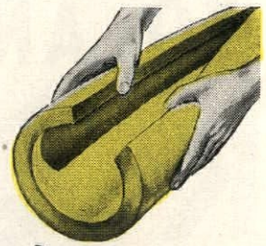
• ENGINEERING • FABRICATING AND ERECTING •

Nothing like new

G-B SNAP*ON

glass fiber pipe insulation!



Molded in one piece with single seam.

Anyone can carry feather-light 6′ sections.

Just spread seam snap over pipe join seam with staple.

Paint if you like. No mud or dust no clean-up time no breakage . Sizes ¾-33″ for hot or cold* piping. Picture the savings.... . Then write today for samples and details.

*Comes with factory-applied vapor barrier facing adhered.

Call your local Snap-on Distributor listed in the Yellow Pages of your Telephone Directory or write for the new 8-Page Brochure.

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Manufacturing Company

Thermal and acoustical glass fiber insulations • Pipe Couplings and fittings

Molded glass fiber pipe insulation

258 WEST 10TH STREET • KANSAS CITY, MO.

LETTERS

OFFICE OF MERIT

Forum:

I congratulate FORUM on its Oct. '54 article on the design and planning of the Thomas & Betts offices.

Both owner and architects should be praised for having created handsome surroundings for the office workers. I am especially pleased since Gordon Powers, the architect, is an alumnus of this office.

WILLIAM LESCAZE, *architect*
New York City

Forum:

It is a very attractive and efficient design —a really good design job. I think that the FORUM might include a "before" picture even though it shows only the desolation of a loft building when it is between tenants. This would give a good story to the possible client who does not always have the facility for imagining what can be done and it certainly would help the architects.

SAMUEL E. HOMSEY, *architect*
Wilmington, Del.

• Here is the loft space before Architect Gordon Powers remodeled it for Thomas & Betts.—ED.

GM TECHNICAL CENTER

Forum:

Your exposition of the GM Technical Center (AF, Nov. '54) makes the reader feel the spirit of the project from the viewpoints of both owner and designer, and I don't know what more anyone could ask. I like it very much.

Your photographers get some beautiful and unique shots, which were faithfully reproduced in print.

EDWARD A. EICHSTEDT, *landscape architect*
Detroit, Mich.

Forum:

The article is well written and the pictures, excellent. . . .

E. F. COVENEY, *vice president*
Bryant & Detwiler Co.
Detroit, Mich.

Forum:

We were very much impressed with the progress report on the General Motors Tech-

continued on p. 58

IN SCHOOLS, THEY CALL IT

"CHILDPROOF" PLEXTONE

and no wonder! This new multicolored paint is stain-mar-grease-scratch-chip resistant!

Williams Green Color-flecked **PLEXTONE,** one of many decorator color combinations for modern or traditional interiors. Also available in monotones and in custom multicolors for large projects.

Never before a paint for school interiors like amazing, rugged Color-flecked PLEXTONE. It's revolutionary . . . two or three *different* colors (sprayed at ONE time from ONE gun WITHOUT SPRAY DUST) which form a multicolored, textured pattern. SCHOOL AUTHORITIES find this new multicolored decorator finish easy on the budget. It resists wear, soil . . . and rambunctious youngsters. SCHOOL ARCHITECTS find that PLEXTONE's uniform coverage on different types of low-cost surface materials gives them new styling resources . . . and new design possibilities because of its *high light reflectivity* and durability. PAINTING CONTRACTORS say PLEXTONE goes on easier, WITHOUT SPRAY DUST, makes possible neater, cleaner jobs. And MAINTENANCE MEN find it unmatched for ease and low cost of upkeep.

SO RUGGED! Color-flecked PLEXTONE resists staining by crayon, ink, candy, grease, and other forms of soil. Its harder, thicker paint film cannot easily be scraped or scratched. It can be washed, scrubbed, scoured — *even sandpapered* — without marring. And touch-ups, if ever needed, defy detection!

SO PRACTICAL! Imagine! This amazing new paint gives you a color-flecked surface consisting of two or three different colors, sprayed from *one* gun at *one* time in *one* coat *without spray dust!* And PLEXTONE's textured surface has unmatched hiding power . . . cleans quickly and easily!

SO BEAUTIFUL! You've never seen a more unusual, more dramatic, more beautiful effect. PLEXTONE's multicolor finish matches the most skilled spatter-dash painting . . . in subtle tones-on-tone or a brilliant circus of colors.

***Write today for FREE* color chips and Color-flecked PLEXTONE application data.**

M.&W. CO. SINCE 1876

PLEXTONE® *COLOR-FLECKED* **TEXTURED ENAMEL**

MAAS & WALDSTEIN CO.

World's Largest Producer of Multicolored Paints

2125 McCARTER HIGHWAY
NEWARK 4, NEW JERSEY

MIDWEST DIVISION: 1658 Carroll Avenue, Chicago 12, Illinois
PACIFIC COAST DIV.: Smith-Davis Co., 10751 Venice Blvd., Los Angeles 34, Calif.

MAAS & WALDSTEIN CO., Architectural Division
2125 McCarter Highway, Newark 4, New Jersey

Gentlemen: Please rush free Color-flecked PLEXTONE color chips and application data.

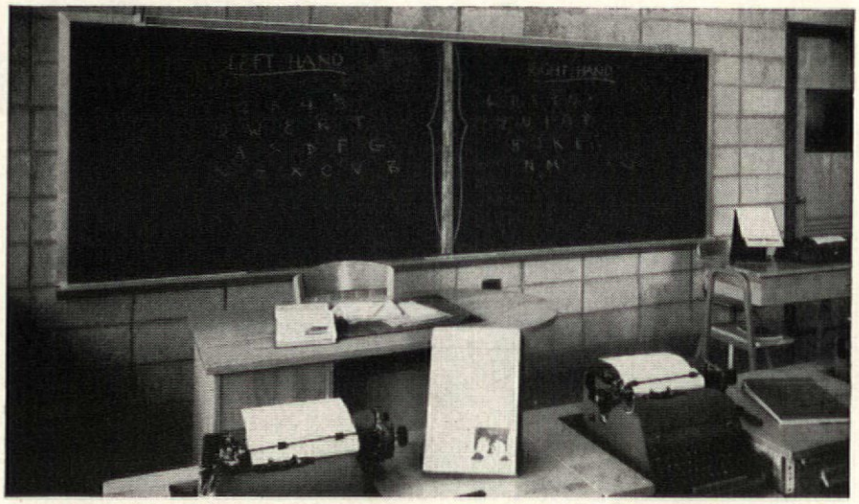
Name_____

Title (or occupation)_____

Company_____

Address_____

City_____ Zone_____ State_____



TYPING CLASSROOM in Valhalla Junior High School, Valhalla, N. Y. Architect: Robert A. Green.

Eye-saving Armorply Chalkboard is the best background for chalk ever devised

And it's easy to install . . . readily used for visual aids . . . is guaranteed for the life of the building

See Armorply Chalkboard just once and you'll agree—the old gray slate ain't what she used to be! Here is a really modern chalkboard—scientifically designed for maximum readability and with a surface that's perfect for presenting magnetic visual aid material.

Tests show Armorply Chalkboard's soft, pleasing green color is best for young eyes. And its reflectance factor of 18.5% is ideal (see diagram).

Save on installation because Armorply needs no costly fixed grounds or surface preparation: it mounts directly to wall. Use Armorply without trim and this saving can be as much as 30%!

Never needs refinishing. Tough porcelain-on-steel face† won't shatter, buckle, warp or break under impact, stress, temperature changes or concussion.

Lifetime guarantee. Armorply Chalkboard is guaranteed *for the life of the building* in which it is installed.

Armorply Chalkboard has industrial applications, too. Specify it for shipping rooms, training departments, airline and bus terminals, conference and board rooms, engineering departments —wherever the finest Chalkboard is wanted. †PORCELAIN FACES BY THE BETTINGER CORP.

NEW! Weldwood Aluminum Chalkboard Trim now available costs less than any similar product on the market.

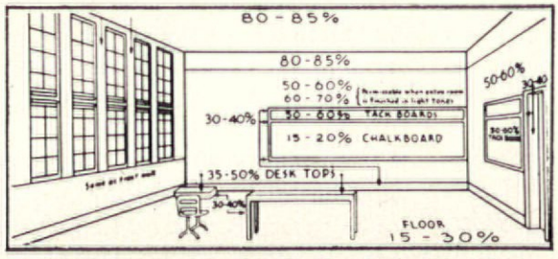


DIAGRAM from "American Standard Practice for School Lighting" recommends reflectance factor of between 15-20% for chalkboard.

*TRADE MARK

MAIL COUPON for brochure and free sample or visit any of the 73 U.S. Plywood or U.S.-Mengel Plywoods showrooms in principal cities.

ARMORPLY CHALKBOARD*

a product of

UNITED STATES PLYWOOD CORPORATION

World's Largest Plywood Organization

United States Plywood Corporation
55 W. 44th St., New York 36, N. Y.

FREE SAMPLE: Please send a sample of Armorply Chalkboard and descriptive literature. AF-1-55

Name.....

Company.....

Address.....

City.....**State**.....

LETTERS *continued from p. 56*

nical Center in the November issue. Of great interest to us was the method used in setting the glass and porcelain panels. . . .

STANLEY E. ARONOFF, *vice president*
The Southern Plate Glass Co.
Baltimore, Md.

Forum:

The designers of the General Motors Technical Center are to be congratulated for a clean, functional, beautiful product. It is hoped that the designers of future General Motors automobiles may be inspired to produce, some day, as distinguished results.

WILLIAM F. R. BALLARD, *architect*
New York City

A RESTAURANT FOR YOSEMITE

Forum:

News item from the New York *Times*: "Washington, Nov. 30 (UP)—The National Park Service disclosed today it has rejected a restaurant design by Frank Lloyd Wright for Yosemite National Park because it would not fit into the scenery."

So that the National Park Service may have its restaurant and the Yosemite visitors remain undisturbed, the following proposal is submitted:

1. At the head of the Yosemite Valley, where it splits into Little Yosemite Valley and Tenaya Canyon, stands Half Dome, a freestanding rock massif towering 4,800' above the valley floor commanding a magnificant 360° panorama with scenic Yosemite to the west and the High Sierras to the east.

2. Half Dome restaurant will be hollowed out of this rock promontory, thereby eliminating the objections to Wright's design (see accompanying sketches). Windows would

Before **After**

follow the natural clefts and fissures of the rock and be only wide enough to be not noticeable from the valley below, thereby allowing the design to "fit into the scenery."

3. Fifty dining rooms, one for each state, Hawaii and Alaska, will be tiered in ten floors with five dining rooms per floor. The decor of each will be colonial so everyone will understand it and no one will be offended.

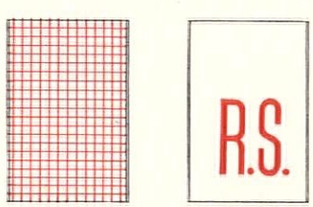
4. Access to the restaurant will be by way of a tunnel, entered on the side away from the Valley and Mirror Lake, to the elevator lobby which rises up through the center of the mountain to elevation 8,722' above sea level, where a special single UN dining room will be superimposed on all the other 50.

continued on p. 62

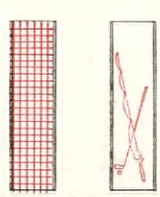
The first new...all-new "Custom" door at standard prices

An outstanding example of the "Kawneer Touch" . . . the new all-welded aluminum door can be "customized" to your needs. Now you can specify a door that is 10% stronger than similar doors, provides a clean, seamless, eye-appealing appearance, and features interchangeable hardware . . . yet the cost compares with other standard doors. Here is the only stock door that can be styled to any type of store. Learn all about it now. See your Kawneer dealer or write Kawneer, Niles, Michigan.

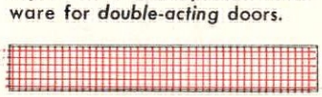
Now! —identification hardware "individually designed"

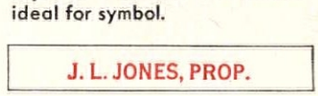


Style "M": Cosmopolitan hardware for *double-acting* doors.



Style "B": Coronet "Pull Handle" ideal for symbol.



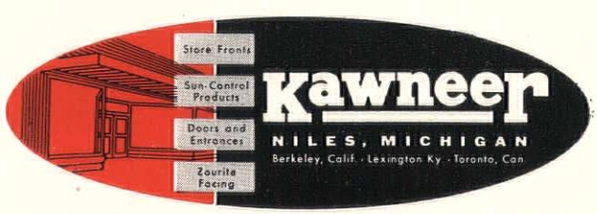


Style "B": Coronet "Push Bar" provides length for full name.

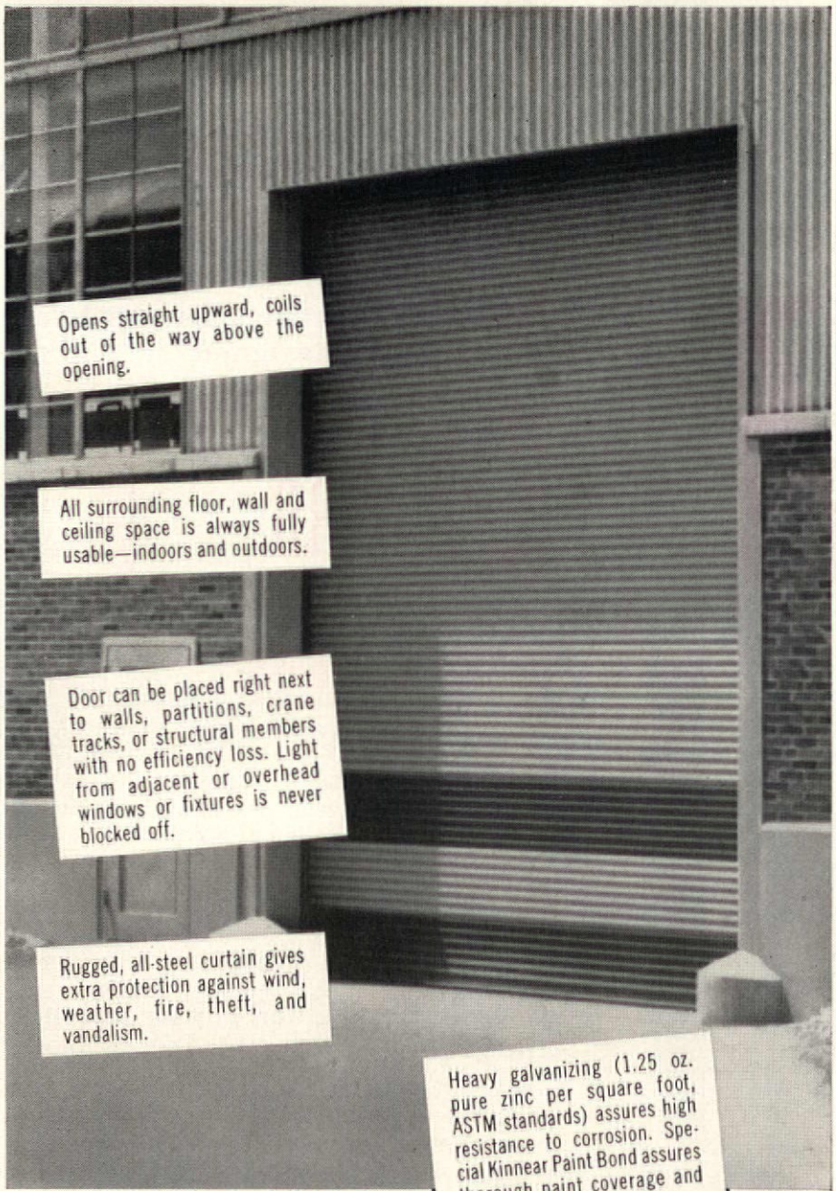
Kawneer offers a choice of four different styles of hardware. The two styles shown have interchangeable face plates. If you wish a face plate to identify any type of business or name, all you do is have artwork prepared. Kawneer will laminate it in plastic, etch it on aluminum, or produce it on any material you desire and in any color. The cross-hatch plate is then merely replaced right on the job with the new design.

Completely welded construction for greater strength—lower cost

- 10% stronger than most doors
- New "deep-weld" penetrates metal 100%
- Hairline joints and unblemished finish for attractive appearance
- No exposed, unsightly screws
- Seamless tubular frame construction
- Long lasting beautiful alumilite finish



Kinnear
Steel Rolling Doors



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Saving Ways in Doorways
KINNEAR ROLLING DOORS

LETTERS *continued from p. 58*

5. This leaves a solid rock cover of about 100′ which, when coupled with the specially fitted interior lead "storm-sash," will give this country undisputed lead in the attempt to protect itself from the inevitable result of the atomic armament race: Half Dome restaurant will be the first underground H-bomb shelter three quarters of a mile above ground.

R. B. CUTLER
Boston, Mass.

● For a description of Wright's proposal see News. —ED.

LANDSCAPER'S THANKS

Forum:

Although you do not mention our particular branch of the architectural profession by name, when in your open letter to Bob Weinberg (AF, Oct. '54) you say that: ". . . the problem lies in getting people to see that there actually is such a thing as outdoor space," you give such clear expression to the landscaper's peculiar problem that I think we should all join in giving thanks for having it so clearly and forcibly stated.

JAMES FANNING, *landscape architect*
New Canaan, Conn.

ATOMIC BUILDING

Forum:

One of our members has called to our attention the article "Building in the Atomic Age" (AF, Sept. '54) with the following comment:

"It is one of the most exciting things I've read. I'd like to see it in the hands of every junior and senior high-school student. I've tried hard to get across to them that the jobs they'll hold during their lifetime don't exist today—so fast is technological change —and that one prepares a foundation upon which to build for them—when they come."

We agree that the article is extremely interesting and one that science teachers would find very useful in their work.

ROBERT H. CARLETON, *executive secretary*
National Science Teachers Assn.
Washington, D.C.

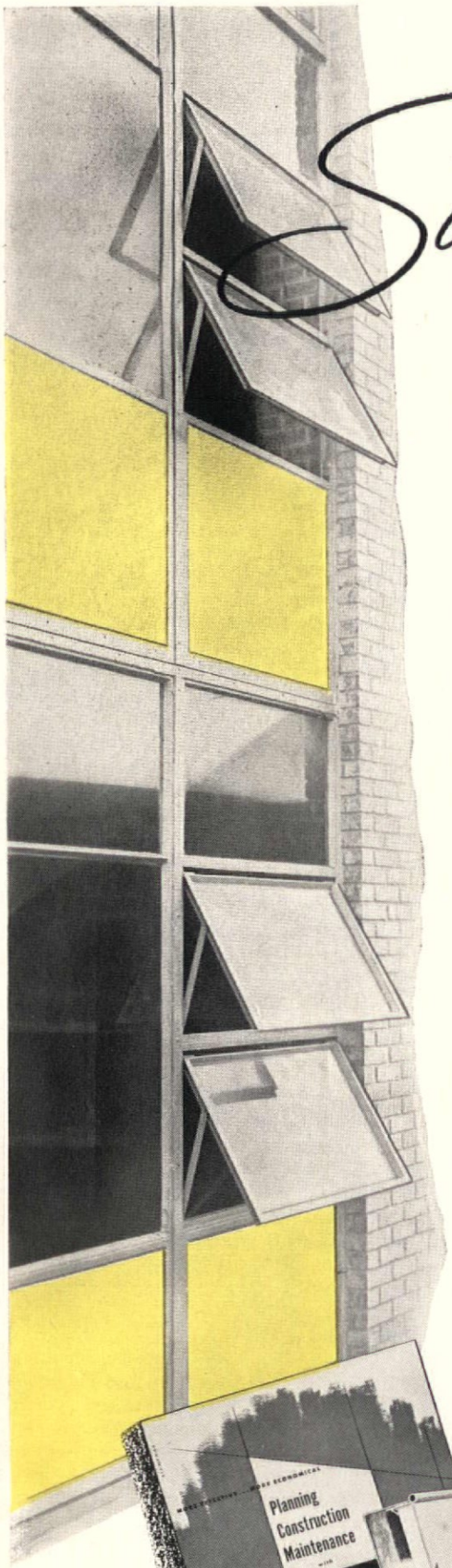
ALLEN ON STORM SEWERS

Forum:

Hereafter when any of my colleagues encounter me I will appreciate it deeply if they will not mention storm sewers to me. Expunge storm sewers from any future conversations you may have with Allen. You will object (you are always objecting to something—I wish you would imitate my own staunch principle never to engage in any argument touching on the controversial) that in the past you have never saluted me with the latest in storm sewer circles. Do not try to lie out of it.

Last Sunday, Grand Rapids, which I would refer to as the garden spot of the universe were it not for the fact that since the last time I tried to raise tomatoes, I

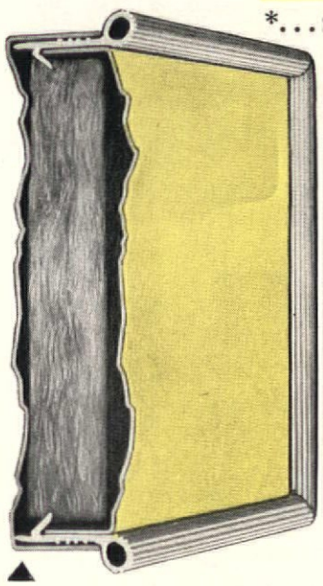
continued on p. 62



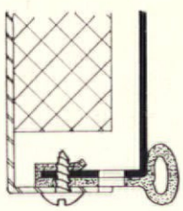
Simplicity

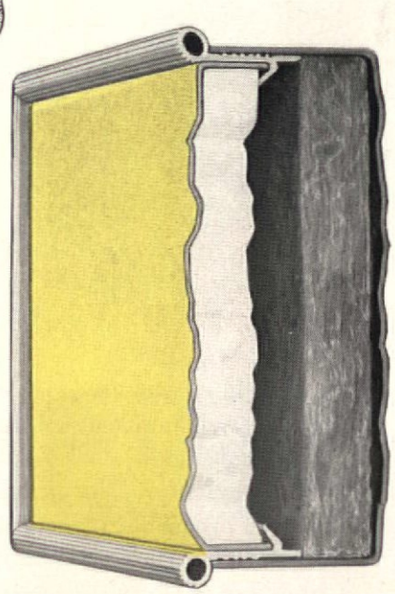
OF DAVIDSON DOUBLE-WALL PANELS* PROVIDES BUILDING DESIGN FLEXIBILITY

...the Modern Curtain-Wall Construction Material



Davidson Double-Wall Architectural Porcelain Panels remove limitations imposed on architectural expression by less adaptable materials. They're supplied in any size or shape, for any framing or fenestration . . . any color, hue or shade, in your choice of effects . . . mechanically assembled, (no adhesives) . . . and both types have weep-holes and fiberglass core to protect against moisture plus lifetime Koroseal** joints, eliminating caulking.





DAVIDSON TYPE A DOUBLE-WALL PANEL

Outer panel, porcelain enamel fused to 16 gauge steel. Insulation, moisture-resistant fiberglass. Inner panel, baked prime finish, porcelain or baked enamel over 16 gauge steel. Mechanically fastened with stainless steel screws. No caulking – indestructible Koroseal gasket furnished.

DAVIDSON TYPE C DOUBLE-WALL PANEL ▶

Outer panel, porcelain enamel fused to 16 gauge steel. Mechanically fastened with stainless steel screws. For unusual strength and "straightedge" flatness, special Vitrock backing cast integral. Insulation, moisture-resistant fiberglass. Inner panel, baked prime finish, porcelain or baked enamel over 16 gauge steel. No caulking – Koroseal long-life gasket furnished.

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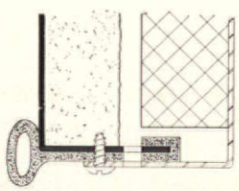

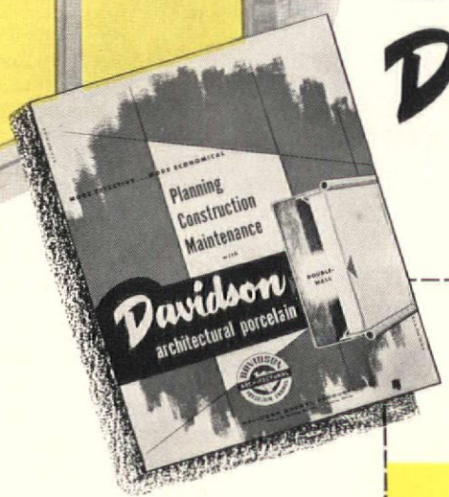

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Photo—Courtesy Republic Steel Corporation, Truscon Steel Division

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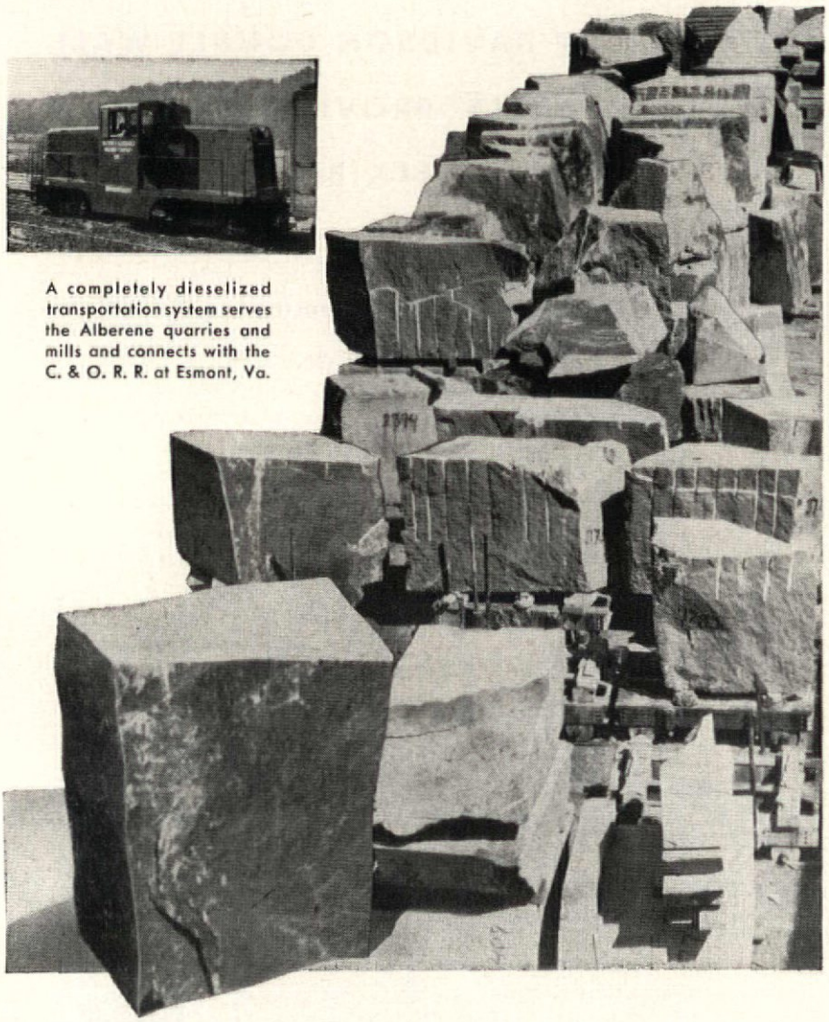

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LETTERS *continued from p. 60*

despise gardens and if anybody sees me with a green thumb, it will be because my fountain pen has been leaking again—last Sunday, Grand Rapids had 4" of rain in less than 24 hours, breaking a record that has stood for 49 years.

It seems there is a law that if the storm sewer in the street is plumb full of water, you cannot get any more water into it. I do not know who promulgated this law but from the acrimony it causes, I assume it was the same fellow who invented the income tax.

Do not object—there you go again—that there are such things as back water valves. You thought you had me there, didn't you? Well, Mr. Smarty, let me tell you that in a career that started some time after my return from Appomattox Court House, I have discovered that back water valves work perfectly as long as you are careful not to let them come in contact with water. Once you do this, you will find that the flap whatzit has become stuck open with bubble gum. I am unable to visualize what kind of people go down into storm sewers to chew bubble gum but such there must be.

We had just been completing the building of a Lutheran Church and a Roman Catholic Church. That was the trouble; it should have been a couple of churches of a variety that believe in baptism by total immersion. They would have had the day for it. It would not have been necessary to build any special tank for the ceremony—they could have just led the candidates down cellar and given them a few concise pointers on the breast stroke.

Naturally, it would have done no good to tell the customers that if the storm sewer in the street is plumb full, you cannot get any more water in it. They would merely consider that I was trying to be evasive.

The following day, my life was a h dash dash l on earth. By nightfall, I was so stirred up that while I am known far and wide, although not as wide as I used to be since I lost so much weight, as Even-Tempered Rodge—my secretary will fall in a swoon when she types this—I got home so irritated that I came within a couple of inches, or possibly a mile, of speaking harshly to my loved ones.

Science is always coming around blabbing about some big deal they have just invented, usually of such a nature that everybody would have been money ahead if Science had kept its big mouth shut. Okay, Science; if you can invent powdered eggs, why can't you invent powdered storm water? You could then package up the storm water and use it as a dry chaser when you are obliged, for medicinal reasons, to take a slug of Old Recent after a hard day hearing about navigating conditions in a client's basement.

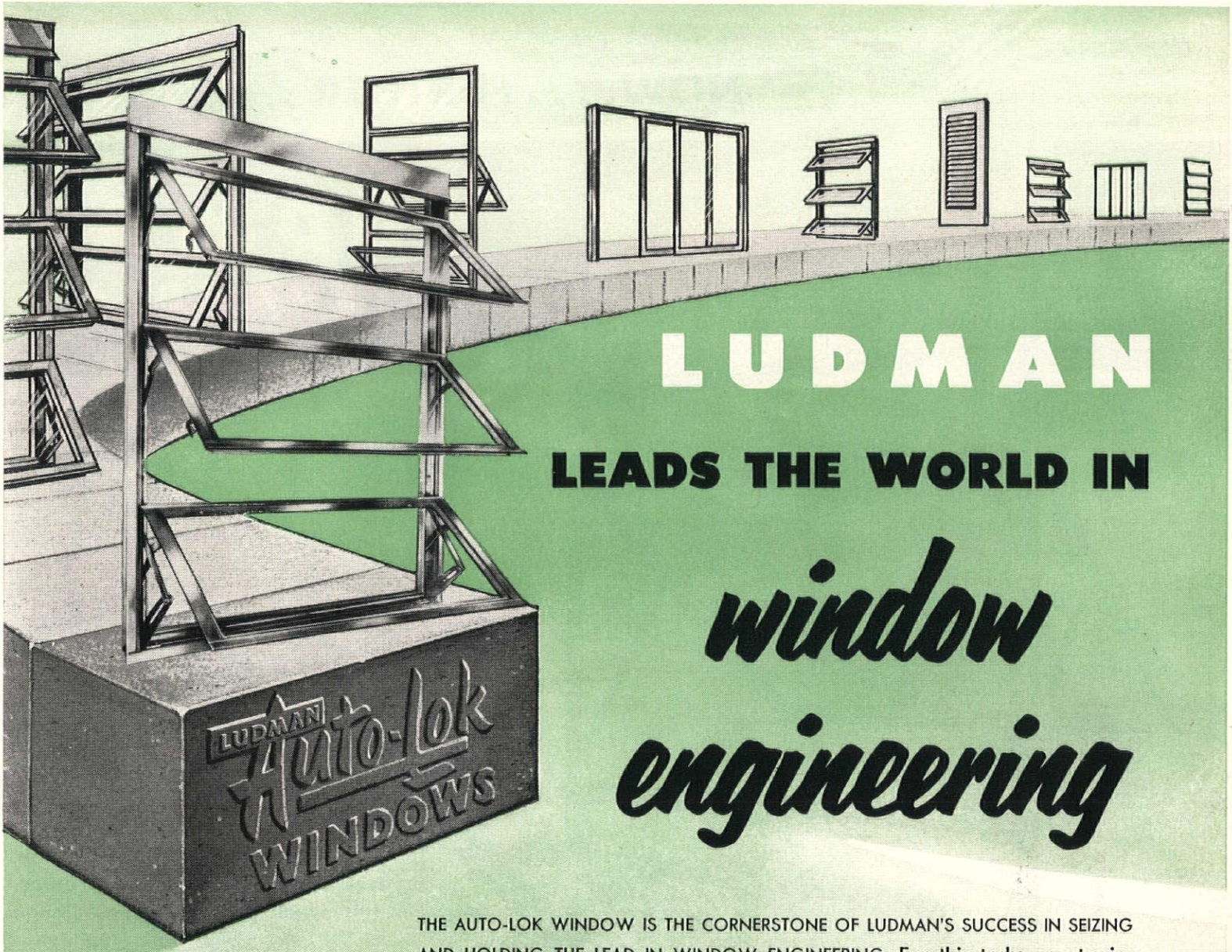
ROGER ALLEN, *architect*
Grand Rapids, Mich.

SHOWCASE SUBSTATION

Forum:

I find the article "Showcase for Electricity" pertaining to substations (AF, Sept. '54) very enlightening.

continued on p. 70



LUDMAN

LEADS THE WORLD IN

window engineering

THE AUTO-LOK WINDOW IS THE CORNERSTONE OF LUDMAN'S SUCCESS IN SEIZING AND HOLDING THE LEAD IN WINDOW ENGINEERING. For this truly great window, the only window that meets all 10 of the vital requirements that experts* agree are really important in a window, is unique in its field.

The original concept of the Auto-Lok window, to produce an all-climate awning window that added total weathertightness, smooth, effortless operation, and engineered reliability to modern design has proved itself in hundreds of thousands of applications. Today, Ludman's Auto-Lok Window is a standard of excellence throughout the building industry . . . . and, today, the engineering superiority of Ludman is manifest in all of its other products. For, on the firm foundation of research and engineering that created the Auto-Lok window, Ludman has earned an enviable reputation for adding quality features, manufacturing skill, and longer useful life to whatever products bear its name.

*Geoffrey Baker and Bruno Funaro in "Windows in Modern Architecture"

Refer to SWEET'S FILE 16

Member of The Producers' Council, Inc.

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NORTH MIAMI
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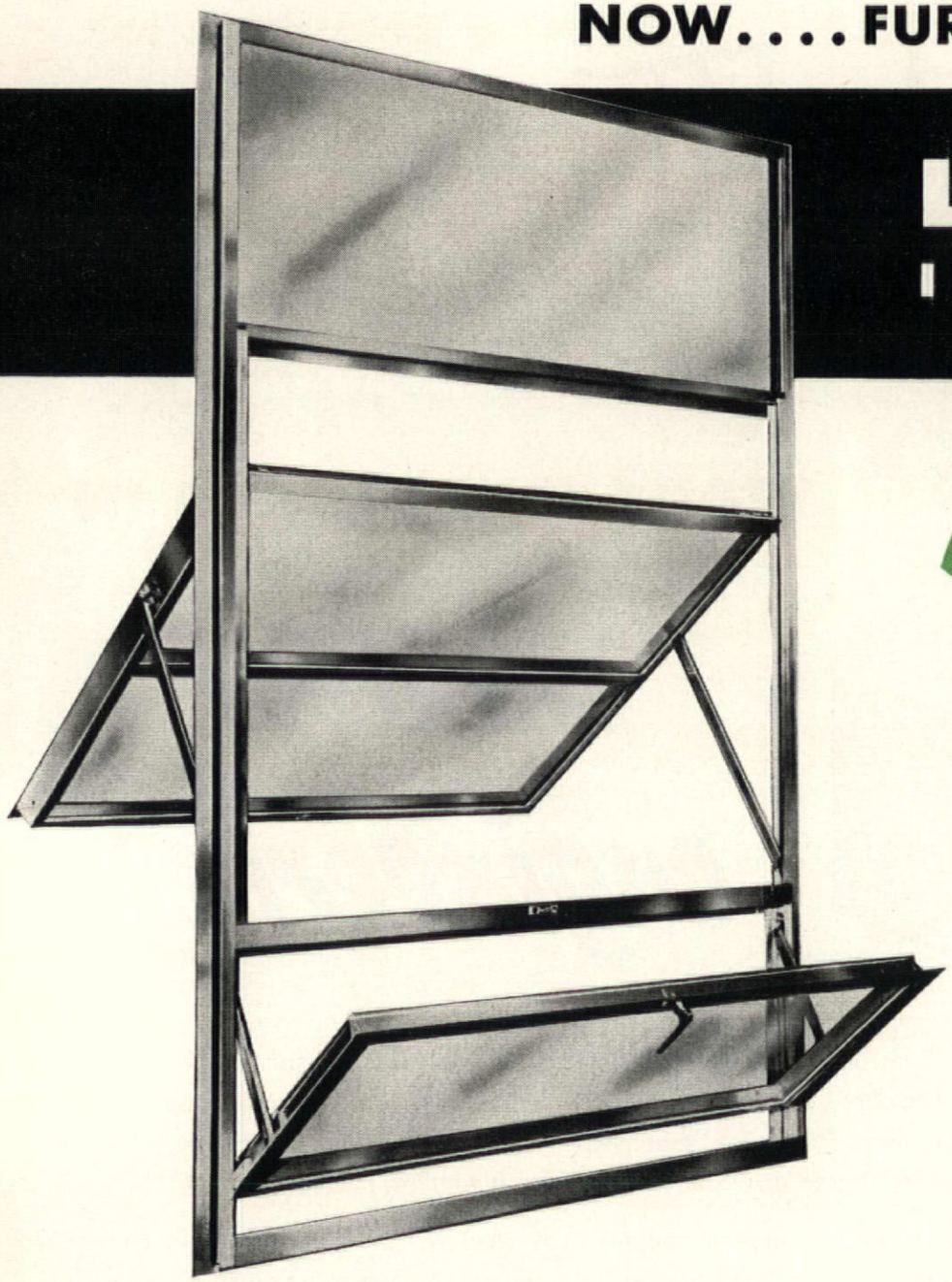
announces an important **NEW** *window*

NOW.... FURTHER *proof* THAT

LUDMAN INTERMEDIATE

Projected Window



This new Ludman architectural, intermediate Projected Window reflects Ludman's basic policy of thoroughly researching and engineering each new product that bears the Ludman name. For this window, like every Ludman product, is engineered to assure long-lived efficiency, operating ease, maximum beauty and greater flexibility in design. And, like all Ludman windows, it is completely weathertight!

Ludman engineering skill has produced a Projected Window that is as far superior to other projected windows as is the famed Ludman Auto-Lok to all other awning windows.

Study the check list. Here is a comparison of the projected windows of eight leading manufacturers with this new Ludman intermediate Projected Window.

Notice that the many features that make the Ludman Window outstanding appear infrequently among the other products. Only Ludman has all the features. And notice, too, how many really important features are exclusive with Ludman.

This important new Projected Window is another cornerstone in the building of Ludman's leadership in window engineering.

THE COMPARISON CHART PROVES THAT THIS GREAT NEW LUDMAN INTERMEDIATE PROJECTED WINDOW, LIKE AUTO-LOK, HAS NO EQUAL

UDMAN LEADS THE WORLD IN WINDOW ENGINEERING

Among the many exclusive features of this newest Ludman window are these which are of prime importance to every architect or designer. It is the FIRST truly modular sized projected window, as recommended by the A.I.A. Modular Coordination Office (Also available in manufacturer's standard sizes). It is the FIRST projected window with corner braces of white bronze for extra strength and rigidity . . . . it is the FIRST projected window that is totally weathertight, because the window is completely weatherstripped and a caulking pocket has been provided between the jamb bar flanges and the overlapping mullion flanges. These, however, are but a few of the important features that Ludman has engineered into this new Projected Window. The check-list below tells the whole story.

FEATURE CHART ● PROJECTED WINDOW MANUFACTURERS

ALL WINDOWS HAVE: ¼" W. S. CONTACT • .125 MIN. THICKNESS • 1¾" WINDOW WIDTH • 1⅝" DEPTH OF SECTION

FEATURES	LUDMAN	A	B	C	D	E	F	G	H	I
1. Truly Modular Window Sizes. Rec. by A.I.A.	✓	ONLY LUDMAN HAS THIS FEATURE								
2. White Bronze Corner Braces For Vents	✓	ONLY LUDMAN HAS THIS FEATURE								
3. Adjustable Friction Shoe Compression Spring	✓			✓		✓			✓	✓
4. Vent Arm Attached To Jamb Thru Threaded Inserts	✓	ONLY LUDMAN HAS THIS FEATURE								
5. Windows Can Be Inside or Outside Bead or Mastic Glazed	✓			✓					✓	
6. Retaining Lips for Mastic Glazing	✓			✓		✓				
7. Hardware & Screws Attached with Threaded Grommets	✓	✓	✓							
8. Cam Handle With Concealed Strike For Project-in Vents.	✓		✓							
9. Limit Stops to Limit Opening of Vent to 50°	✓	✓								
10. Mullion Bars Provide Caulking Pocket For Weather Tite Construction	✓	ONLY LUDMAN HAS THIS FEATURE								
11. Weathering, Horiz. Frame Members & Vent Flanges Lap To Form Straight Lines	✓								✓	
12. Mullions Fluted Vertically For Appearance & Strength	✓	ONLY LUDMAN HAS THIS FEATURE								
13. Hardware Bars 3/16" Web	✓	✓	✓	✓	✓	✓	✓			
14. Glazing Beads In Vent Do Not Require Hold Down Screws	✓	ONLY LUDMAN HAS THIS FEATURE								
15. Weatherstripped	✓					✓				✓
16. 2-pc. Mullions	✓		✓	✓		✓	✓		✓	
17. Intersecting muntin joint securely locked by screw for added rigidity and proper glass clearance.	✓	ONLY LUDMAN HAS THIS FEATURE								

FOR FULL INFORMATION ON THIS IMPORTANT NEW INTERMEDIATE PROJECTED WINDOW SEE SWEET'S FILE 16.

SEND COUPON ON NEXT PAGE....

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YES . . . I would like full details of the following Ludman products for my files:

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Auto-Lok Wood Awning Windows....Single Sash Awning Windows....Shower Door Tub Enclosures....

NAME:.....FIRM.....

STREET.....CITY.....ZONE.....STATE....

*Geoffrey Baker and Bruno Funaro in "Windows in Modern Architecture"

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To get your free copy just fill in and mail the coupon. Better do it now.

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Start with the problem. For example, resistance to corrosion in contact with copper sulfate. Just set the slide at the proper index number shown on the Selector (in this case on the back), and you have the answer in a second – grades 302 and 316 are fully resistant to this form of attack.

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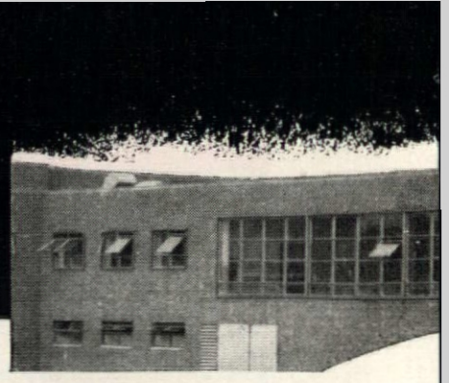
54 years of Fine steelmaking

STAINLESS STEELS

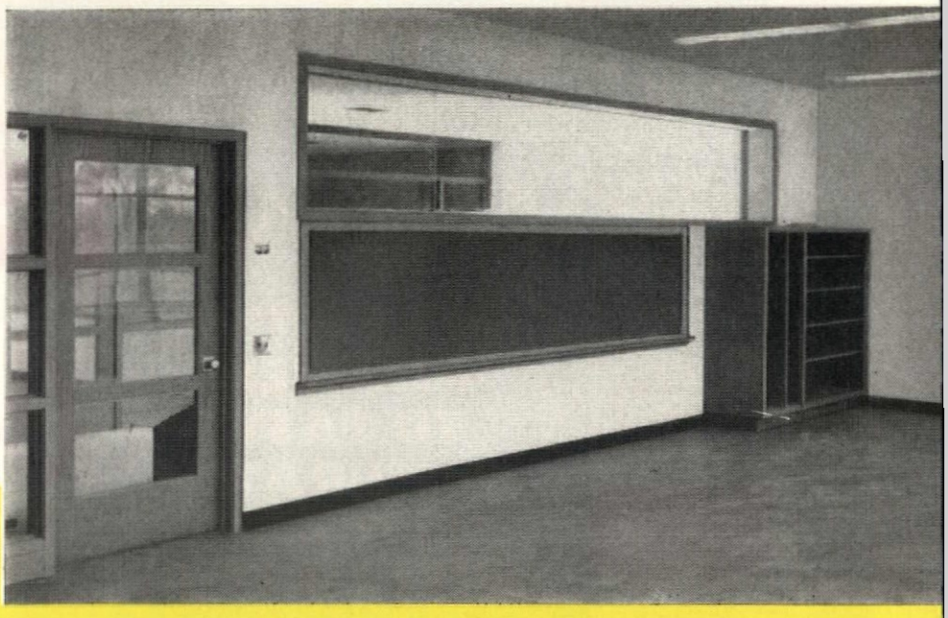
CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

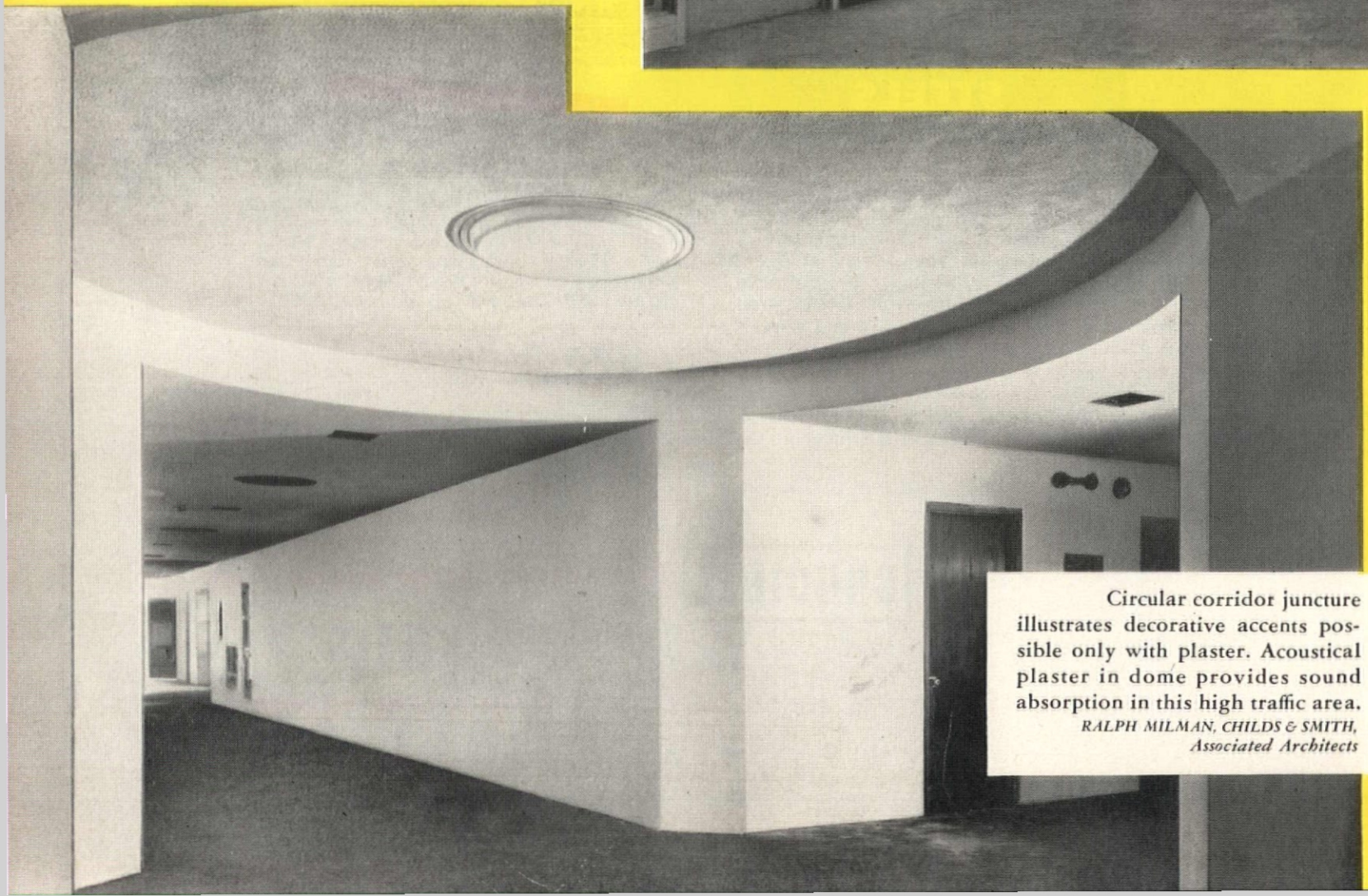
LATH and plaster



results in lower

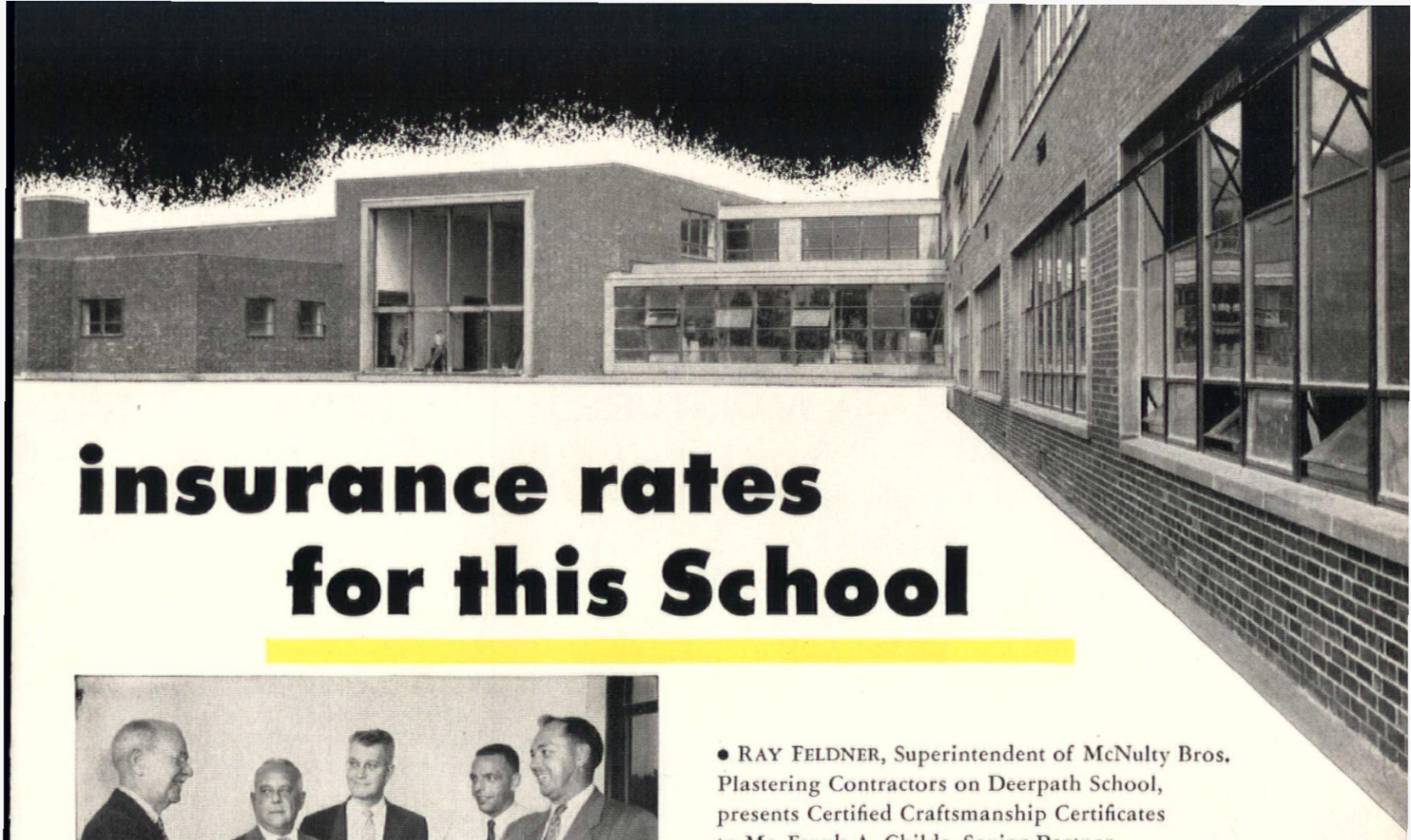
Frederick F. Quinlan, Superintendent of Schools, Lake Forest, Illinois, says, "After careful study, we found lath and plaster the best choice for our new Deerpath School. It provided the fire protection and permanency we feel is especially necessary in a school building. And we were pleased to find it was more economical. For example, lath and plaster ceilings effected an insurance saving which will recover the additional cost in three years—and yield a four figure premium saving each year thereafter."





Circular corridor juncture illustrates decorative accents possible only with plaster. Acoustical plaster in dome provides sound absorption in this high traffic area.

RALPH MILMAN, CHILDS & SMITH, Associated Architects



insurance rates for this School

• RAY FELDNER, Superintendent of McNulty Bros. Plastering Contractors on Deerpath School, presents Certified Craftsmanship Certificates to Mr. Frank A. Childs, Senior Partner, Childs & Smith, Architects; Mr. Ralph Milman, Architect; Mr. Frederick F. Quinlan, Superintendent of Schools, Lake Forest, Illinois; and Mr. William D. Matthews, Construction Superintendent, John Griffiths & Sons, General Contractors.

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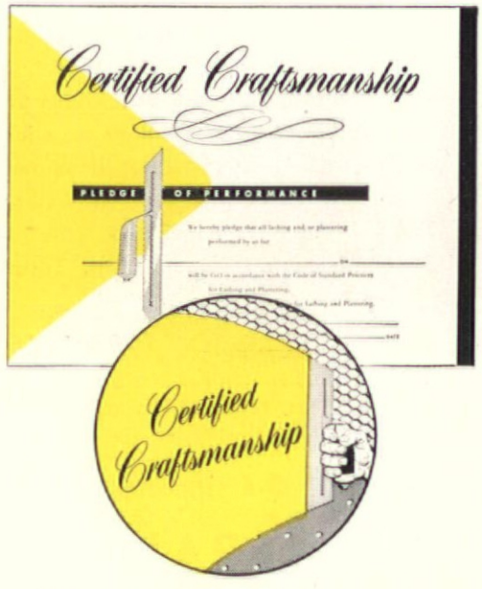
• *This Pledge of Performance* is your *written* and *signed* assurance that the lathing and plastering on specific jobs will be in compliance with the newly adopted Code of Standard Practices for Lathing and Plastering. This Code was developed by the National Bureau for Lathing and Plastering, an organization of contractors and craftsmen. It is subscribed to by scores of local chapters throughout the country.

Certificates issued on specific jobs are written commitments to work schedules, job cooperation, work of craftsmanship caliber and nationally recognized standards of quality. They are yours for the asking from lathing and plastering contractors adhering to the Code.

We suggest a thorough reading of the Code of Standard Practices which appears on the back of every pledge. Ask your lathing and plastering contractor for a copy. Or write National Bureau for Lathing and Plastering, 1401 K Street, N.W., Washington 5, D. C.



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Ask your water repellent supplier about a treatment based on G-E DRI-FILM silicones! For the names of suppliers using DRI-FILM in their products, just write to General Electric Company, Section 55-1A, Waterford, New York. (IN CANADA, write to Canadian General Electric Company, Ltd., Toronto.)

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DRI-FILM silicones offer you a profitable opportunity to add a superior masonry water repellent to your product line. Ask us about DRI-FILM 103, a new G-E silicone material with important formulating advantages!

G-E silicones fit in your future

GENERAL ELECTRIC

LETTERS *continued from p. 68*

We have given our stubstations considerable study relative to making them unobtrusive and in some way an interesting part of the landscape. We have accomplished this in many cases by landscaping, using small shrubbery and dwarf trees.

The solution by the B. C. Electric Co. is unique and pleasing plus interesting to the public, thus aiding in the public relation factor. Those involved in its planning, engineering and construction are to be commended.

CHARLES W. MCCORMICK
Commercial sales manager
The Connecticut Light & Power Co.
Berlin, Conn.

HOW TO FINANCE SCHOOLS

Forum:

Your article on school finance (AF, Oct. '54) was timely and helpful. In a few words, you have given us an idea of what is being tried in different parts of the nation and of other possibilities for financing school construction.

Texas will need more than twice as much money to meet its school facility needs by 1959-60 as can be obtained from the existing tax source. We must assume that the tax structure will be changed, the money will be supplied from some outside source, or some of the needed facilities will not be provided.

JOE R. HUMPHREY, *director*
School plant services
School administration services
Texas Education Agency
Austin, Tex.

Forum:

We have been very much impressed by the article.

JEROME C. PATTERSON, *managing editor*
The Education Digest
Ann Arbor, Mich.

Forum:

. . . This is a most timely article.

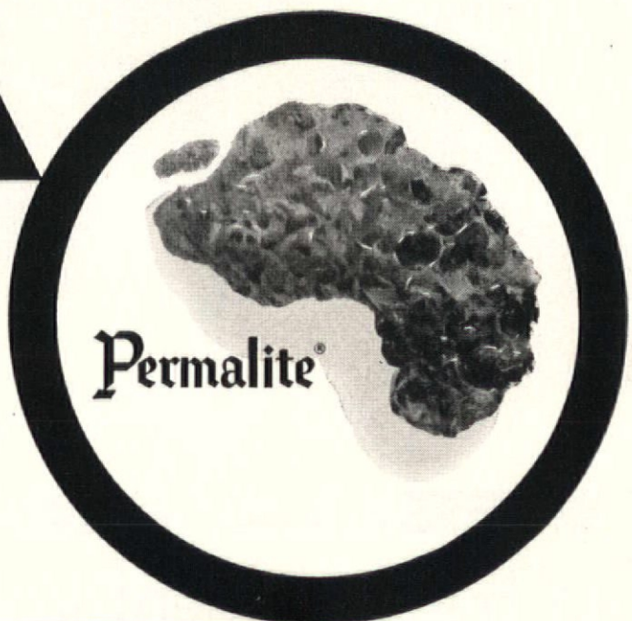
The article suggests several practical solutions. It also recognizes that there is no one solution which will fit all situations from the standpoints of adequacy, practicability or justice.

Following the recent war I served as director of the school building division of the Education Department of the state of Washington. Our experience in administering a state-financed school building aid program in an area which has grown rapidly indicated that a long-term program for financing school construction might operate as follows:

1. School districts experiencing a considerable increase in enrollment due to the efforts of housing developers, such as the Levitt's, should be authorized by law to assess each new dwelling unit an appropriate amount to be used for new school construction. In practically every state new dwelling units are not placed on the tax rolls for at least a year after construction. They are responsible for an increase in construction before they can be used as the basis for bonding. In those states where

continued on p. 74

SYMBOL OF A NEW FREEDOM



freeing today's architecture from the shackles of dead weight, Permalite makes possible lightweight concretes and plasters for modern construction, for insulating, for fireproofing —gives to the architect new freedom to pioneer in the design for buildings of tomorrow. To learn the many ways this amazing material can serve you now, pin this page to your letterhead and mail to the address below. Full factual data will be sent you.

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PEELLE MOTORSTAIRS

a basic element in this new approach to bank planning

When you enter the ground floor of the American National Bank of Austin, Texas, you do not see the usual phalanx of vice presidents behind glass-topped desks. Instead there are attractive shops—shops paying *high rents* to the owners. Peelle Motorstairs make it possible to release this high-income, ground floor space for profitable rentals. And, besides making it convenient for the bank's patrons to go to and from the banking offices on the second floor, Peelle Motorstairs add much to the modern design of the entire building.

This is just one of the many fine buildings in which Peelle Motorstairs have been advantageously used in plans for better use of space and *higher income*. Peelle Motorstairs are designed and engineered for economical, long-lasting performance under modern conditions. Their handsome appearance is the outward manifestation of the advanced engineering that has assured their widespread preference.

Write for full information and technical details.

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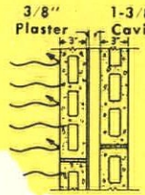
OFFICES IN PRINCIPAL CITIES

Some "Sound" Advice

There's a good reason why exposed concrete masonry walls are used in so many new television and radio studios, school auditoriums and classrooms, and theaters—wherever it is desirable to reduce noise within the room and sound transmission from room to room.

A typical cavity partition wall for a television studio might have either a 3″ or 4″ lightweight concrete block wall section (with ⅜″ plaster on cavity side), a 1⅜″ cavity, and a second section of 3″ or 4″ concrete masonry wall. (See detail below). This wall would absorb about 55% of all sound waves striking it. (By comparison, hard plaster or glass absorbs only about 3%). Reduction in sound transmission through the wall would be about 55 decibels. (A rating of 45 or more is considered excellent for TV and radio studios, school band rooms, etc.). This concrete masonry "television wall" usually costs less than 50% as much as comparable walls built with other sound-absorbing materials.

VT Television & Radio Studios
Clifford Evans, *Architect*



Lightweight concrete masonry cavity partition wall will absorb up to 55% of sound striking wall, and reduce sound transmission from room to room about 55 decibels.

Hard plaster or glass absorbs only about 3% of incident sound—97% "bounces back."

For details consult your local NCMA member, or write

National Concrete Masonry Association
38 South Dearborn Chicago 3, Illinois

Investigate the advantages of sound-absorbing **Concrete Masonry**

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LETTERS *continued from p. 70*

statutory or constitutional limitations exist on the bonding capacity of the school district in terms of a percentage of the assessed valuation, this fact is particularly serious. In states such as Washington, where school construction can be financed through an exess levy on real property, the new dwellings coming on the tax rolls a year after construction often escape paying any tax for construction.

2. In areas affected by federal activities, the extent to which the school population is increased by such activity should be reflected in the amount of assistance granted by the federal government for school construction. This is now cared for quite satisfactorily under the federal government program (Public Law 815).

3. School districts which must put forth a greater-than-average effort to replace existing plant or to add plant to meet a *normal* increase in school enrollment should be given state aid on an equalization basis. This is done now in several states. Equalization can be achieved if the inequalities in property assessments are cared for in the state aid formula and if the assessment ratios are determined by some agency such as the state tax commission.

State aid for school districts in this category should come from current state income and not from bond issues. On a state-wide basis school building to meet replacement needs or normal growth needs should be regarded as a recurrent expense and not as an emergency.

4. School districts experiencing sudden and greater-than-average increases in enrollment which cannot be housed under either 1 or 2 (above) should be given state aid on an equalization basis. State funds for this program, if more than normal growth in school population is quite prevalent through the state, should be financed by the sale of state bonds, since this now constitutes an emergency.

CLEVE O. WESTBY, *coordinator*
State Teachers Colleges Construction Program
Department of Education
Trenton, N. J.

CHICAGO'S PLAN COMPETITION

Forum:

You have told the story of the Carson Pirie Scott competition (AF, Nov. '54) very well, but I have some very real concerns about the validity of calling such contests city planning. . . .

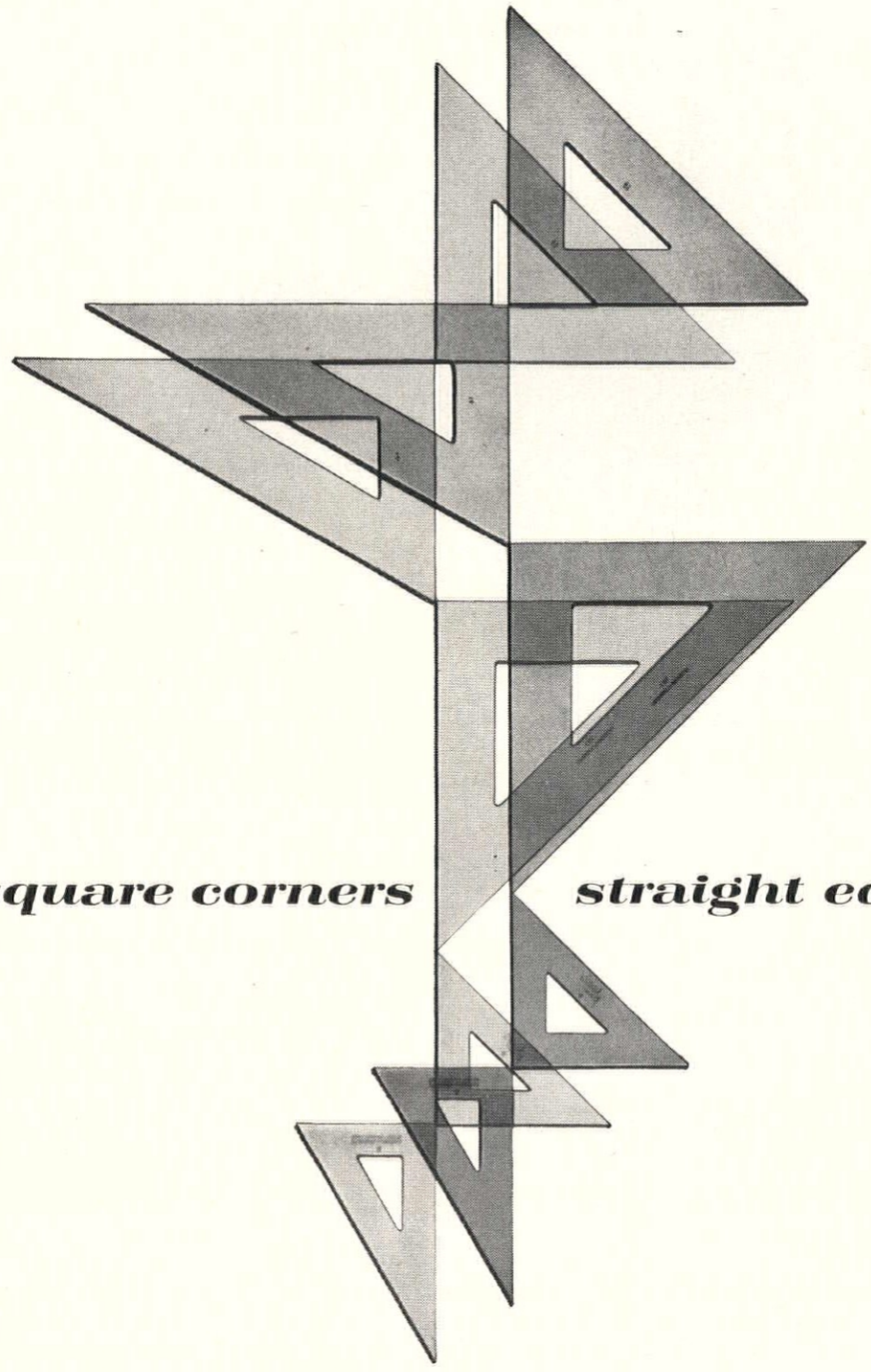
PERRY L. NORTON, *executive director*
American Institute of Planners
Cambridge, Mass.

Forum:

You have done a very good job in giving a streamlined presentation of the award winners. . . .

The most interesting aspect of the Carson

continued on p. 78



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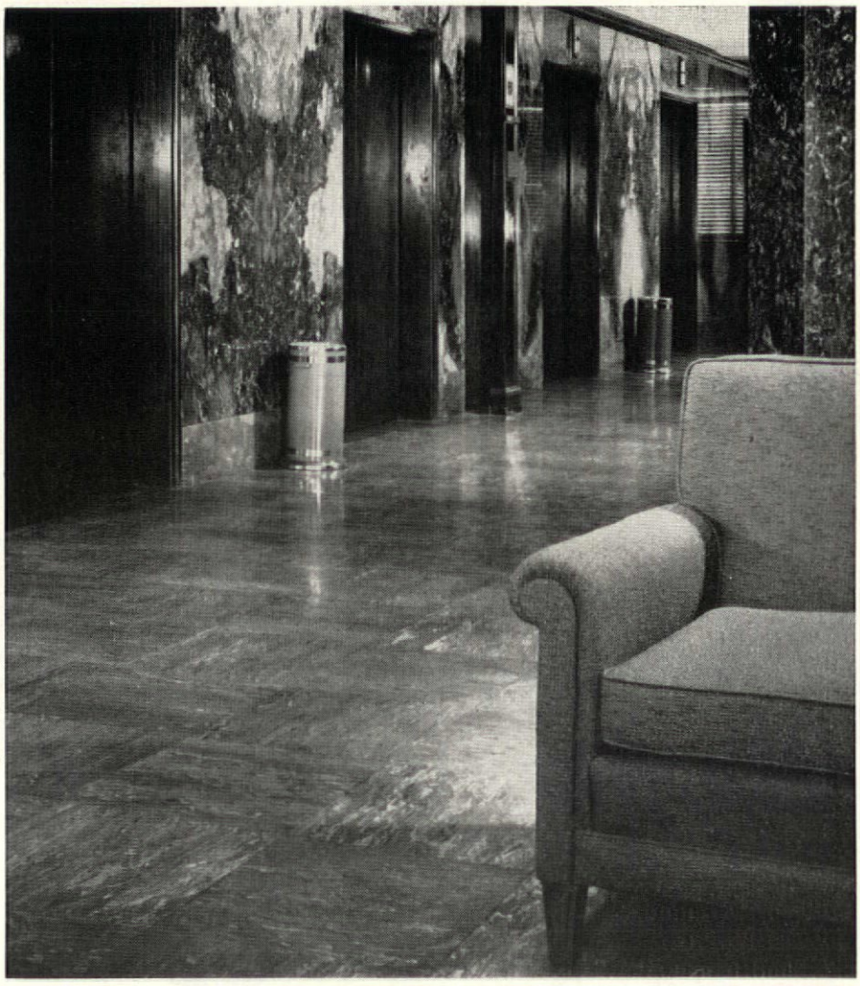

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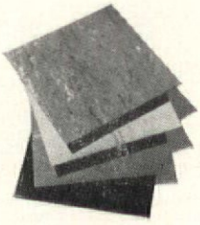

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RUBBER TILE
The 100-Year Floor!

5257

LETTERS *continued from p. 74*

Pirie Scott contest will be to see what schemes the Chicago Plan Commission will be able to assemble from the various entries —and what part of these schemes the citizens of Chicago will get behind and carry through.

DENNIS O'HARROW, *executive director*
American Society of Planning Officials
Chicago, Ill.

GRAND CENTRAL

Forum:

Your comments and suggestions about Grand Central Station (AF, Nov. '54) are most interesting.

As important as design is in Grand Central Terminal, we might first look at the value of Grand Central Terminal to over-all transportation needs. "How necessary is Grand Central Terminal," at least regarding its use by commuters?

One of the most serious deficits in city planning today is the lack of adequate plans for public transportation. A completely modern *high speed* rail transportation network in the New York area might make Grand Central Station's use by commuters somewhat less important than now.

If transportation were being properly planned for the New York metropolitan area, *all* suburban trains would operate through Manhattan and terminate in suburban areas. For example, suburban trains coming in from Westchester County should operate through Manhattan to outlying points in New Jersey. While all Long Island trains today terminate in Pennsylvania Station, they should be operated through to New Jersey points. In the case of the Long Island Railroad, an eastside Manhattan station should be built and trains could quickly load and unload their passengers at Penn Station and at the newly built station and move swiftly on to New Jersey points. This would also help Long Island and New Jersey commuters destined to eastside Manhattan points.

As another example, if Westchester County trains came into Manhattan, they could stop at a point above Grand Central Station, at Grand Central Station and downtown. This would eliminate vast amounts of congestion at subway stations and would move people to their destinations in more comfort and less time.

We first need over-all metropolitan planning which would integrate and coordinate all transit and traffic functions. We can then worry about the design and use of stations.

Until more emphasis is placed on proper public transportation facilities, we can never expect to reduce the congestion from which all our major cities are now suffering.

PHILIP H. GOLDMAN, *secretary-treasurer*
Dispensers, Inc.
Los Angeles, Calif.

● FORUM did not argue for the preservation of Grand Central Terminal en toto, but only the beautiful big room known as The Concourse.—ED.

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The new clay tile adhesive that cuts installation costs up to 20%!

Makes clay tile practical for every use

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CTA-11 is tough, resilient and durable, too—resisting cracks, moisture and settling. For setting ceramic floor tile, specify CTA-12 and profit from similar cost-cutting advantages.

CTA-11 for walls . . . CTA-12 for floors . . . to make the beauty and utility of clay tile practical for every application. For the complete details on CTA-11 and -12, write today to 3M, Department 181, 417 Piquette Avenue, Detroit 2, Michigan.

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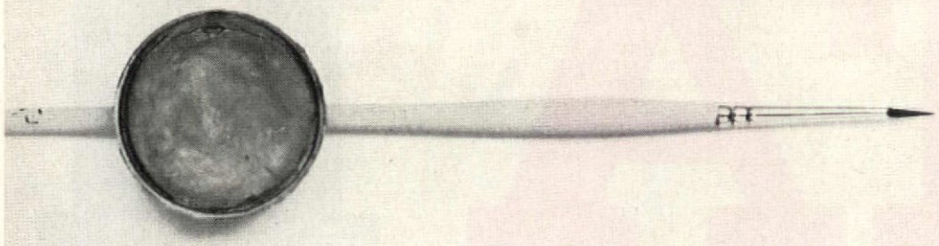
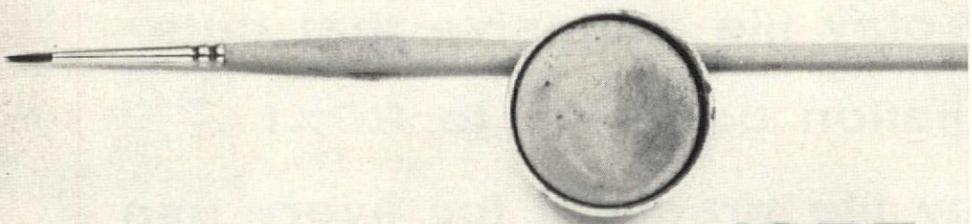


THE ORIGINAL CARPET WITH THE BUILT-IN SPONGE RUBBER CUSHION



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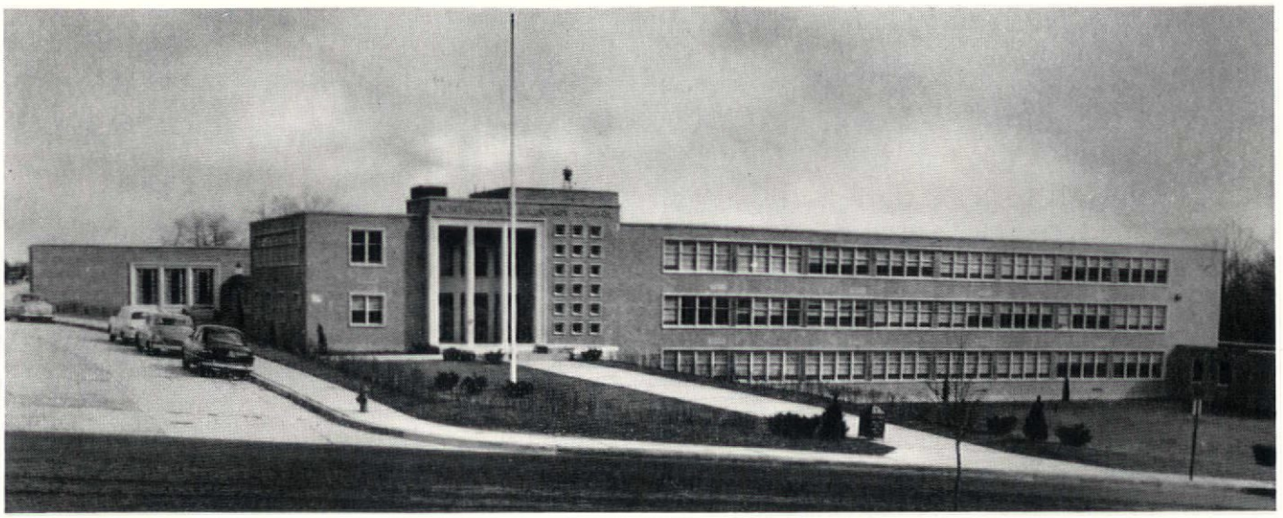

Modern Northwood Elementary School has 25 classrooms, an auditorium, gymnasium, cafeteria and 12 miscellaneous rooms. Architects, Jamison & Marcks; Mechanical Engineers, George & Hartman; Builder, Leimbach Construction Corp.; Mechanical Contractor, H. E. Cook Co., Inc.—all are of Baltimore, Md.

Another modern school gets modern boilers — Pacific Boilers with Jet-action Circulation!

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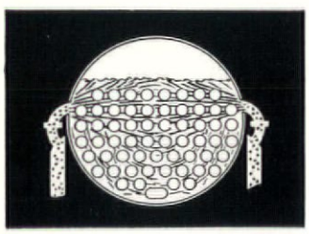
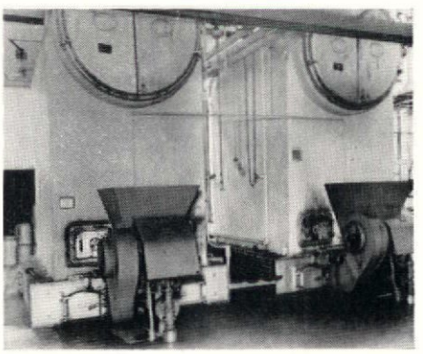


Tubes absorb heat faster; fuel consumption is lowered. And when temperature changes are desired, response is practically immediate!

These benefits of Pacific Boilers are important to you . . . to your customers as purchasers. For only Jet-action Circulation provides such fast-acting, economical operation.

Pacific Boilers come in all sizes, using all fuels, for all types of buildings. For catalogs and more data on how Pacific Boilers can help improve your installations, call your local Pacific representative today!



Northwood's two Pacific Boilers with Jet-action Circulation provide dependable, economical heat. Because shell can be separated from firebox, installation of these boilers is quick and easy.

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Please send me complete information on Knapp Unit Wall System.

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Included in this revolutionary system are ventilators for fenestration if required, insulated panels and all other accessories that make up a finished wall system. It can be adapted to all types of single and multi-story buildings, and is available in *steel* or *extruded aluminum.*

Knapp engineers are on call to study your requirements and suggest how the Knapp Modular Grid Wall System will fit into your building.

SYSTEM

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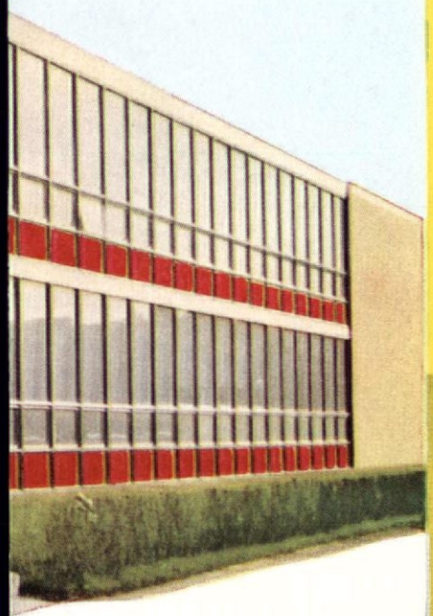
FLEXIBILITY OF DESIGN. Knapp Unit Wall Panels are assembled at the factory with the exception of glass. Each unit is complete with insulated metal panels and ventilator completely caulked. They provide full flexibility of design. Ventilators, fixed glass and insulated panels can be varied to meet the individual requirements of the job.

ATTRACTIVE APPEARANCE. The insulated panels are available in a variety of materials including aluminum, stainless steel and porcelain enamel in a wide range of *non-fading colors.* The neat, trim, streamlined appearance of the Knapp Wall System enhances the functional beauty of modern institutional, commercial and industrial buildings.

LIGHTWEIGHT. Knapp Metal Wall Panels are lightweight compared with masonry construction. This feature effects substantial savings in structural framing and footings. Reduced wall thickness adds substantial amount of floor space in multi-story buildings.

COMPLETE FACADE CONSTRUCTION. Because it is difficult to segregate door framing from exterior facade, the Knapp Wall System is designed to include framing to fit all door openings specified by the architect. *Here is the system you can specify to include the complete facade to be furnished by a single manufacturer.*



KNAPP BROS. MFG. COMPANY, 16 E. 72nd St., Cincinnati 16, Ohio

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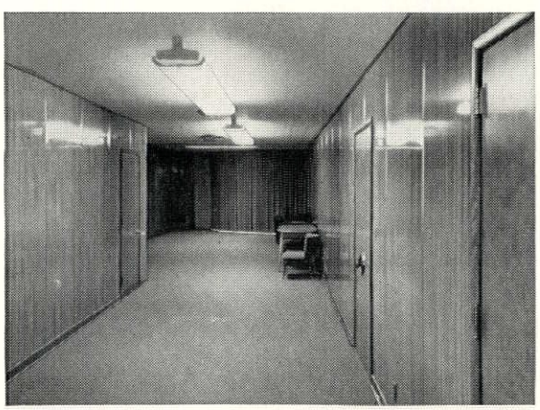

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architectural **FORUM**
the magazine of building

Men behind the blueprints in this month's FORUM

Photos: Roy Stevens; John McCullough; LIFE*—Walter Daran*

ARCHITECT: William Wilson Wurster: he gave the Center for Advanced Study in the Behavioral Sciences a fine campus (p. 130) in a hurry—only six months from commission to moving day. And some observers have called it the best architectural group of our time. This mixture of efficiency and quality is Wurster himself. His deceptively easy manner belies his ability. He runs as senior among three partners a top-notch office which thrives on taking in an unusual proportion of small jobs the kind of work which would starve the average architect) and at the same time he administers a state university architectural school. He was dean of MIT's school until 1950, when he simplified his commutation problem by taking the same position at the University of California.

OWNER: Dr. Frank Stanton: as president of Columbia Broadcasting System, he brought to his office project (p. 135) the same good design that characterizes CBS' products and promotion. Stanton is a designer at heart and has a meticulous, artistic sense—a fact attested by everything about him. His apartment is filled with Stanton-designed furniture and paintings and sculpture of discerning taste; even his stationery and special paper clips reflect his great attention to detail; his office is a showpiece. It reflects the personality, talent and good taste of Stanton, as well as Knoll Associates. Says Florence Knoll: "Many of his ideas are evident in the final design of his office."

Stanton heads the study center designed by Wurster (left).

ENGINEER: W. Frederick Schmidt: he directed the research for the engineering firm of Edward E. Ashley which led to the first big office building installation of high-voltage wiring—in the Socony-Vacuum building now going up in New York (p. 86). Until the Ashley firm was called upon as consultants, the owner planned to use conventional 220-v. wiring. Now, thanks to Schmidt's research, the wires will carry 265-460 v.; yet the more powerful, more versatile system will cost no more than a conventional one. A consultant since 1932, the Ashley firm has handled the electrical engineering of many other big buildings, including the Alcoa office tower in Pittsburgh, and the mechanical engineering for many others, including the air conditioning of the Empire State building.

SOCONY-VACUUM will add substantial mass to the midtown area of Manhattan

NEW YORK'S BIGGEST

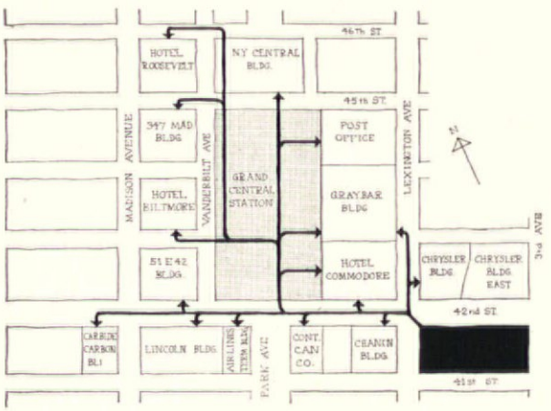
ASSOCIATED ARCHITECTS: Harrison & Abramovitz and John B. Peterkin
STRUCTURAL ENGINEERS: Edwards & Hjorth
MECHANICAL ENGINEERS: Jaros, Baum & Bolles
ELECTRICAL ENGINEERS: Edward E. Ashley
GENERAL CONTRACTOR: Turner Construction Co.
ELECTRICAL CONTRACTORS: Fishbach & Moore

Photos (above): Fairchild Aerial Surveys, Inc.

The center of gravity of the Grand Central area in New York City is being moved slightly to the southeast. On a full two-acre block between Lexington and Third Aves., Real Estate Operator John Galbreath of Cincinnati has broken ground for a mammoth, de luxe steel-sheathed office building to house 10,000 of New York's white collars on 42 floors. To be completed in 1956 for about $45 million, it will be the largest air-conditioned commercial structure ever erected.

Socony-Vacuum Co., which only a few months ago was casting longing eyes at a suburban headquarters, has leased more than 500,000 sq. ft. of the structure's 1,300,000 sq. ft. of net rentable floor space and so the building will be called Socony-Vacuum (90% of the remainder is prerented as well).

To be built on one of the few remaining great sites in New York, 83,000 sq. ft. owned by the old Goelet estate, the new cliff of offices will not be distinguished



CONCOURSE

Tapping the underground spring of traffic into the Grand Central Terminal, the new building's concourse level will be extended as far as 46th St. and Madison Ave., through and past Grand Central, taking much of its rush-hour commuter traffic off the sidewalks.

EARLY RENDERING shows massing but skin and first floor still are on the boards

BUILDING IN 25 YEARS

in the way UN and Lever House are, in slender striking mass. Instead, its robust personality will be keyed by the soundness of the spaces for rental, and its impact will be made by the great exterior wall of stainless steel. In space there will be three distinguishing features:

1. The second floor will be the biggest office floor in New York City, 75,000 sq. ft. Other floors, as they diminish upward in two steps (see plans, p. 90) also are unusually large, attracting large corporations as tenants.

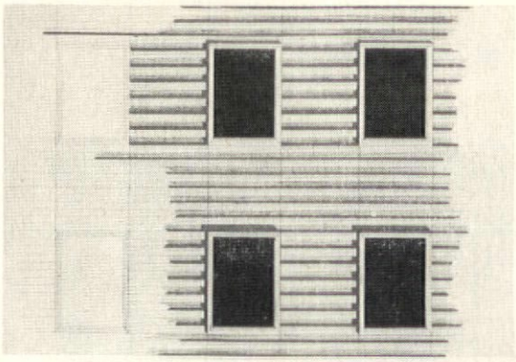
2. The tower floor will be only 18,000 sq. ft., in conformance with the city's stiff old zoning restrictions.

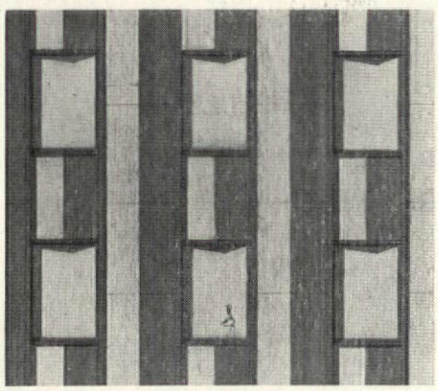
3. The intermediate floors are not so large as zoning would permit; the designers preferred to cut them back to make better space.*

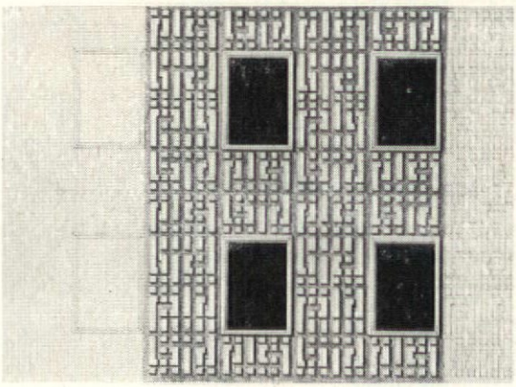
* The new code proposed in 1950 by Harrison, Ballard & Allen would have permitted the tower to be bigger, and base smaller, perhaps averaging out at about the size of the middle section. It was blocked by New York's stiff-necked building boss, Robert Moses.

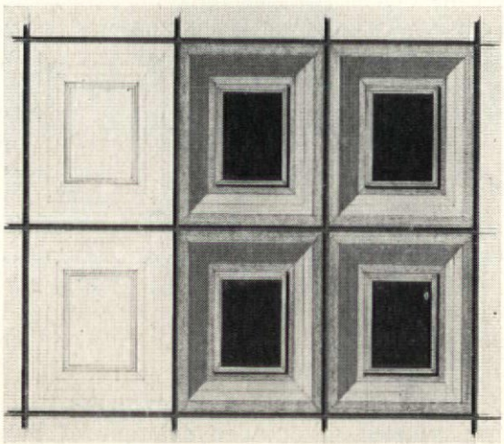
Socony-Vacuum will be a first-class, high-rental structure (up to $7.60 per sq. ft. per year). To get it built, Galbreath engaged a supporting cast of New York's best construction and engineering firms, with Architect Wallace Harrison as the star. For the story of how the building happened—a detailed example of how intricately a New York office building must be promoted—see p. 91.

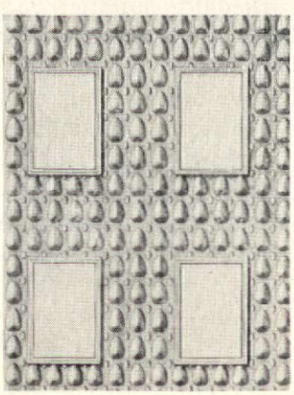
Features of the Socony-Vacuum design include, for the first time in New York in a big office building, the use of a high-voltage wiring system and operatorless self-service elevators. Of more particularized note, Harrison's window design (detail, p. 90) is the most determined effort yet to avoid leakage in New York cliff structures. But architecturally, the emphatic feature of Socony-Vacuum will be the stainless-steel skin. The walls will wear an armor of 20-gage type 302 stainless (11 acres in area, 750,000 lb. in weight), and will be just as radical a departure from the contemporary modern idiom











FIVE STUDIES for treatment of stainless steel were selected from hundreds sketched and considered. (For final choice, see opposite.) Although stainless steel stands up uniquely well under drawing in the big presses, the bottom sketch and middle sketch in this column could not be produced.

as was Harrison & Abramovitz's Alcoa building in Pittsburgh. Obviously the steel people are hopeful that Harrison will define their material for curtain wall use as dramatically as he did aluminum.

The idiom will be markedly different. Where Alcoa's aluminum wall was pressed into a simple, large-scale geometric pattern which in effect suggested an abstraction of the old rustication technique for stone, the new stainless-steel wall will have a smaller, more intricate faceting stamped into it, will have a "carved" effect—a design sure to arouse architectural controversy.

This building will not be anonymous among New York's towers; the sixth largest office building in the nation, and the largest metal-clad office building in the world, it will be an emphatic symbol for a long time of the use of stainless as a curtain wall.

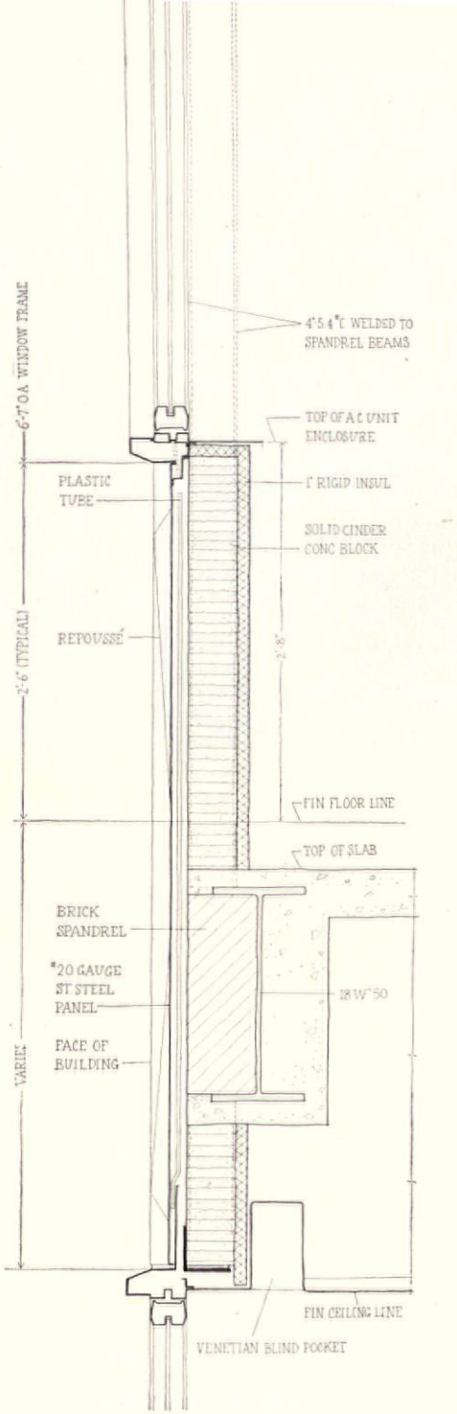
THE WALL. In working out the stainless-steel skin, .037″ thick 18-8 chromium nickel, 302 type, the architects had a piece of pioneering to do. They studied textures, shadows, stampings, rolled forms; they learned to use splayed patterns, avoiding horizontals with the soiling and streaking they would bring in New York. To make sure all were agreed, they made full-sized models in plaster and called in stamping and metal die men from large outfits, including automotive producers. From these they learned the limitations of presses, and above all the effects of flow in metals. In the end all knew more than any had known at the start.

The windows are vertically pivoted for washing from the inside, and hurricane-conscious Harrison went after weather-tightness in winds of 100 mph or more with double vinyl gaskets and even a plastic drip tube between. The window-frame projects out over the panel throwing a shadow, and at one point the designers wanted to project the glazing, too, but they could not because the structural steel had already been ordered and the habitable face of the tower was already right up to the limit of the zoning envelope.

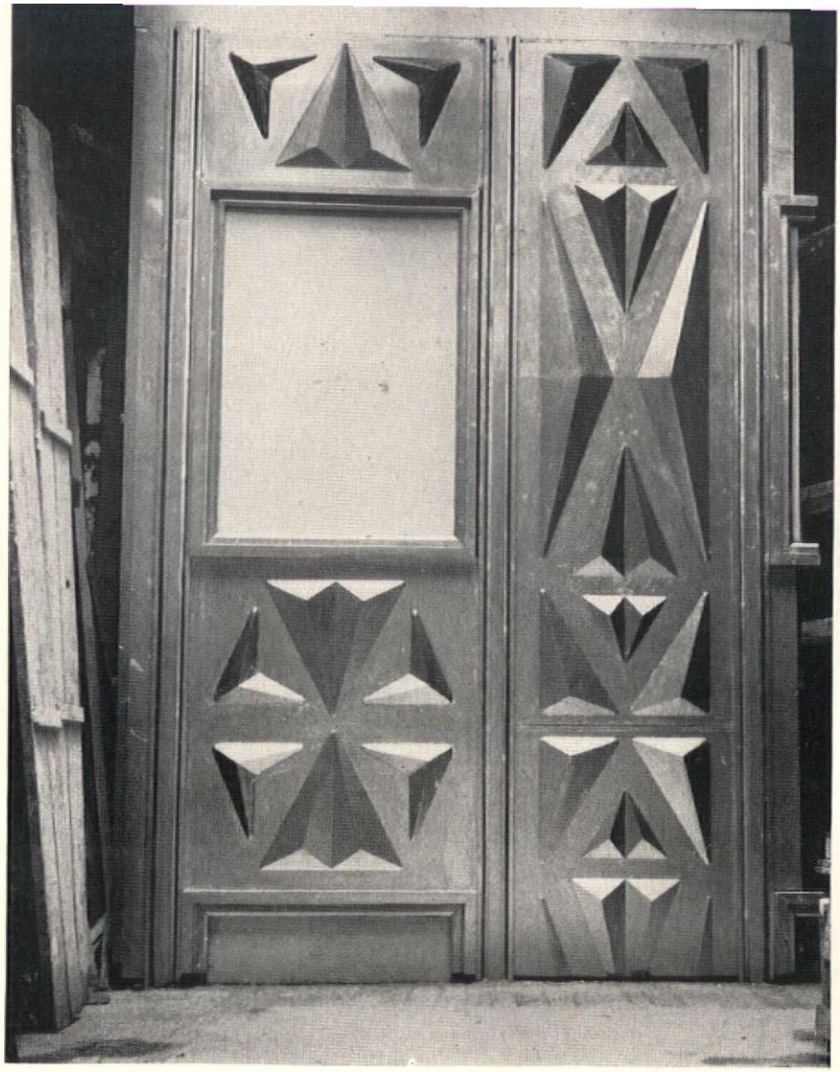
The steel will be backed up by a 4″ masonry wall to satisfy requirements of New York's building and fire code. Although the stainless sheathing is considerably heavier than the stainless used, for example, in some railroad cars, it still weighs only about 2 lb. per sq. ft., as compared with about 48 lb. per sq. ft. for the 4″ brick exterior wall which the building's frame was originally designed to carry.

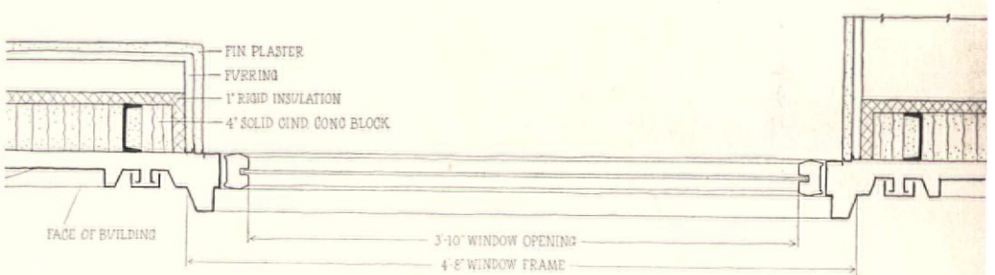
THE WIRING. Socony-Vacuum will be wired up to 6 w. per sq. ft. of floor area—4 w. in the ceiling, 2 w. in the floor. The ceiling circuit will be 277 v. (powering rapid-start fluorescents), the floors the standard 120 v. All built-in lighting will be run off the high voltage except the building service areas, but standard voltages remain very important. Although the ever increasing load of electric office equipment is a big factor in increasing the necessary electricity put into office structures today, the equipment still uses standard voltages, so the high voltages must be transformed down on every floor. But the transformers take little room, and the potential economy of the high-voltage system is immense. From these same feeders, power could be increased up to 8 w. per sq. ft. if necessary. The UN Secretariat, for example, is also powered up to 6 w. per sq. ft., but its potential without new feeders does not compare with Socony-Vacuum's. The high-voltage system also saves money in eliminating the need for starters in the ceiling fluorescent fixtures.

The distribution system will be 460/265, three phase, four wire. Electrical risers will be 6″ 4,000 amp. flat-bar aluminum bus duct run vertically. (When electrical contractors bidding the job were allowed to choose flat or triangular aluminum bus, flat copper, or copper cable and conduit, ten out of the eleven picked the flat aluminum because it goes in so easily—two workmen can handle a 10′ section.) Estimated full load for the building is 10,000 kw. Tenants will be separately metered. Consolidated Edison, the local utility, is setting six 2,000 kva transformers under the sidewalk to handle present and future needs.

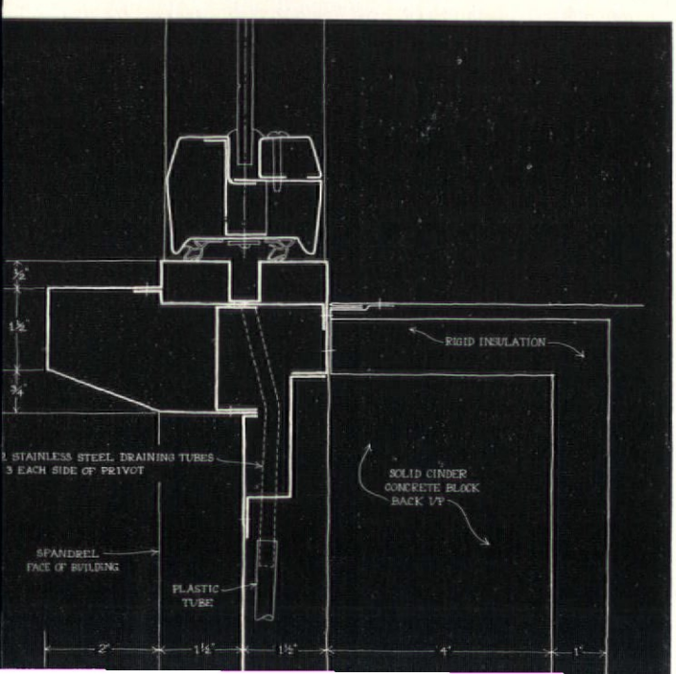


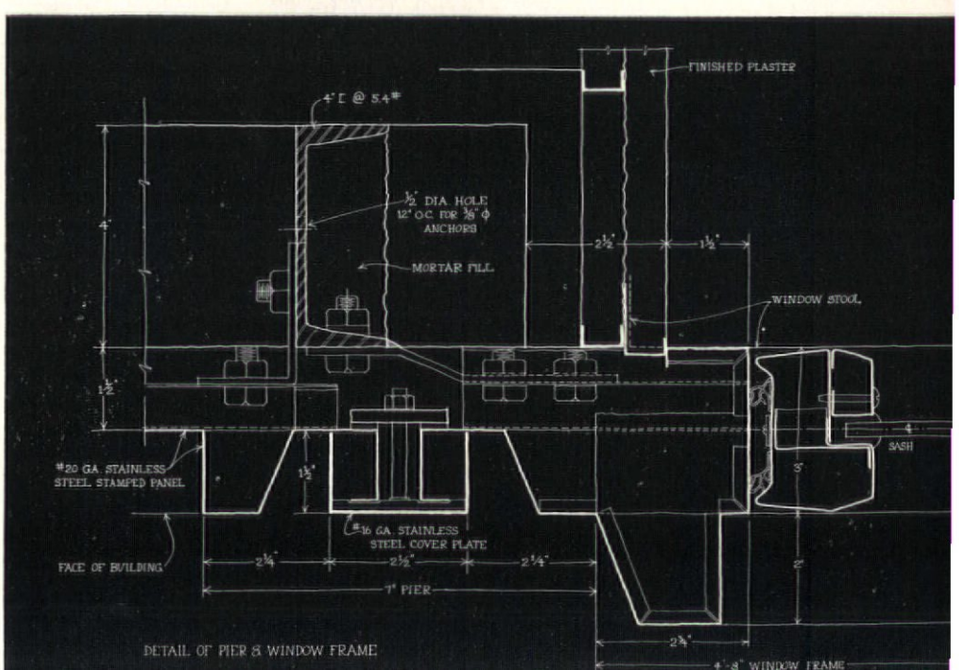
WALL DETAIL shows stainless armor, bolting, backup and reversible window. Note long plastic drain from within plastic weather-seal in sill. Wall is 8" thick before finish.



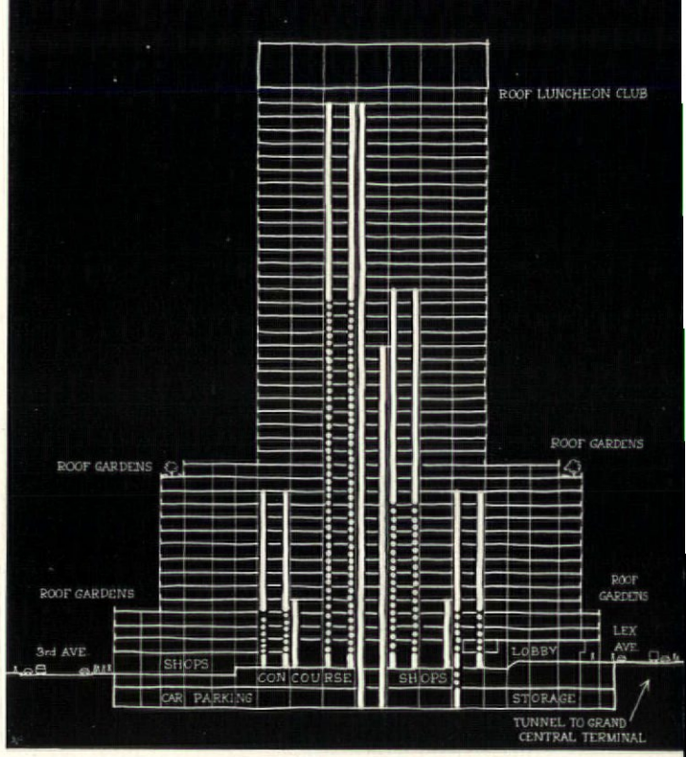


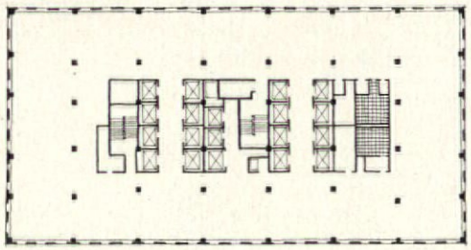
SAMPLE PANEL wears stamped faceted design finally decided upon. A practical design for production, its facets will offset the tendency of all sheet metals to bend slightly.



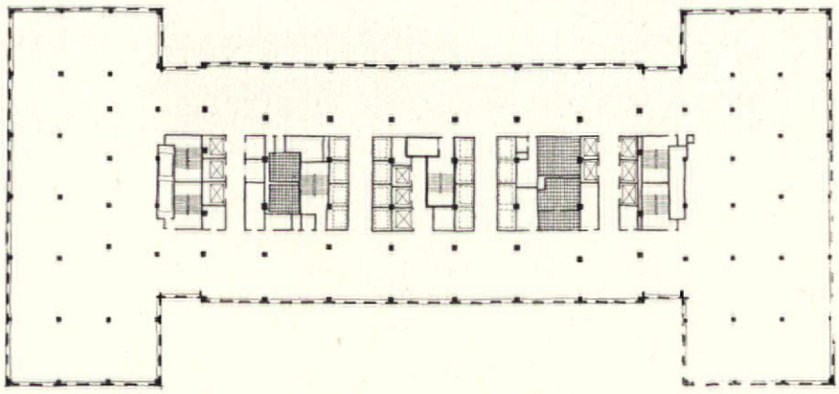


DETAIL OF PIER & WINDOW FRAME

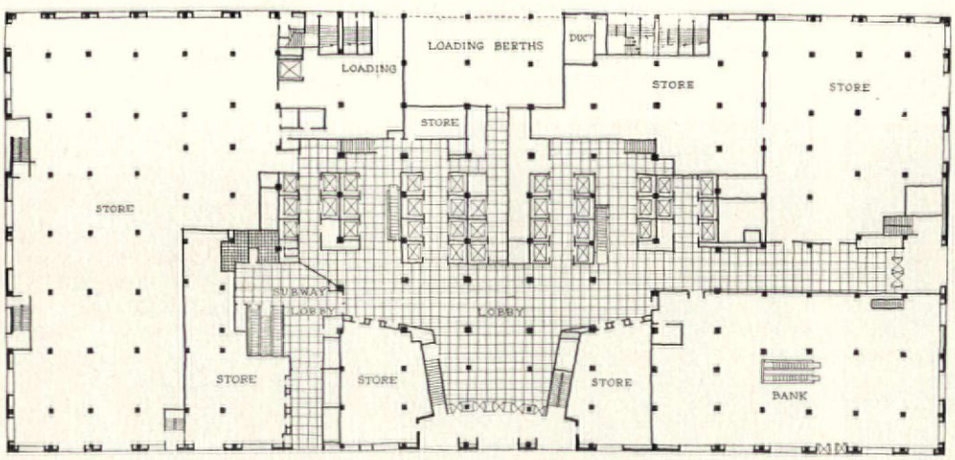




24th–29th FLOORS



9th–11th FLOORS



GROUND FLOOR

PLANS show three typical floors from tower down to main floor. Fourth to 14th floors are not built out to zoning envelope; tower and base floors are. In section above right, note difference in elevation between Lexington Ave. and Third Ave. and its solution within the structure.

THE ELEVATORS. Six banks of self-service elevators, a total of 32 cabs, will travel in nearly 9 mi. of elevator shafts, at speeds ranging from 500′ to 1,200′ per minute. (Total elevator time from lobby to 42nd floor will be 30 seconds.) There will also be four service elevators and two 4′-wide escalators to carry passengers up and down between the shop-lined concourse, below the street level, and the lobby floor. The $3,250,000 elevator contract is the largest in elevator history.

The elevators' routes: three low-rise cabs running from lobby to fourth floor on both east and west sides of building; five intermediate-rise elevators running from lobby to 12th floor in east wing; five intermediate-rise elevators running from the lobby to the 11th floor in the west wing; eight upper intermediate-rise elevators running from lobby to 25th floor in the tower; eight high-rise elevators from lobby to 42nd floor, also in the tower.

THE AIR CONDITIONING will be powered by purchased steam, which actually will be used twice. Three turbo-compressors in the subbasement will take the biggest part of the load, totaling 2,500 tons of refrigeration. These, including a 1,000-ton extraction turbine, will cool the building from the concourse through the 14th floor. Then exhaust steam from the extraction turbine will be piped to the roof, where it will produce up to 1,400 additional tons of refrigeration in motionless absorption units to cool the tower floors. Even the condensed steam from the absorption equipment will be used; after giving up its heat to the reheat stacks for humidity control, it will be discharged to the cooling tower as replacement for water lost by evaporation. A network of individually controlled room units plus high pressure interior zoning will be the distributor.

THE TEAM: *a behind-the-hoarding report on the many people—from landowners to tenants—who helped shape this $45 million building*

One of the most vivid dramas of this frenetic age is the sudden transformation of yesterday's rubble pile into today's office building. Yet the turning of the first spadeful of dirt must often be preceded by years of cooperative hoping, trying and planning by everyone concerned with the building.

The latest example of this phenomenon—the 42-story Socony-Vacuum building now going up in New York City—will be completed in 1956, almost 14 years after the landowner first thought about putting a skyscraper on the property.

A purist could trace the new building's geneology even further, to the 1870s when the Goelet family began gathering the land that by the late 1940s included the entire block from 41st St. to 42nd St., bounded by Lexington and Third Aves.

Back in 1942, before the entire parcel was assembled, the Goelet estate (holders of much of Manhattan's prime property) had building plans for the land they owned at that time.

The consulting architect for the Goelet estate was John B. Peterkin. He knew the city would soon need another air depot, even though he had then just completed the Air Lines Terminal building on 42nd St. and Pershing Square.

Peterkin thought this property was ideal for just such a depot. His earliest building plans for the site showed air-line facilities on the first few floors and about 30 floors of office space above, suitable for the kind of corporate owner the Goelet estate wanted to attract. The estate had no luck in convincing any large corporation to build on the site, but it kept on, led by one of their chief advisers, Charles Mylod, acquiring more and more of the block.

By the late forties, when the parcel was completed, Architect Peterkin had a closet full of sketch plans drawn for a succession of blue-ribbon prospects—but no takers. Nobody wanted the worries of owning a block-long, midcity skyscraper. Peterkin's work did not go to waste: the Socony-Vacuum building is remarkably close in appearance to some of his earliest drawings.

Deals of the magnitude of the one that the Goelet estate was attempting cannot be kept hidden. Numerous offers to buy were soon received from realty men but an estate bound by restrictive wills could not easily sell. Nor did the Goelets want to lease to a speculative builder who might get only short-term tenants.

Then, about three years ago, into the picture stepped famed real estate operator John Galbreath and his partner, Peter Ruffin. Like everyone else in the real estate business, they knew Goelet's difficulties. But Ruffin, from long years in the business of renting office space in New York City, knew that many companies wanted to move into the Grand Central zone, and he knew what kind of a building would attract them.

Taking the combined role of agent-entrepreneur, Galbreath and Ruffin told the Goelet estate that they would construct a high-rental, class "A" office building and tenant it with major corporations holding 25-year leases. As for financing, such a building and such leases would quickly attract insurance companies and banks.

The Goelets, protected by holding refusal rights on the plans, told them to go ahead, try it.

People and plans

To get the tenants the promoters had to have plans; to get financing they had to have tenants. So with Architect Peterkin's earlier sketches in hand, Galbreath and Ruffin approached a top-flight, glamorous firm of architects (Harrison & Abramovitz), and an equally prominent builder (Turner Construction Co.). Together they were asked to work out a block-long, tower skyscraper with 42 rentable floors for 25-year leases to top-rank tenants. This meant over 1.3 million sq. ft. of rentable space, to be fully air conditioned, to be served by high-speed elevators, and to cost between $40 and $45 million.

Turner's Executive Vice President George Horr had a special incentive for strict cost control, because his fixed fee contract threw the cost of any miscalculation back on Turner.

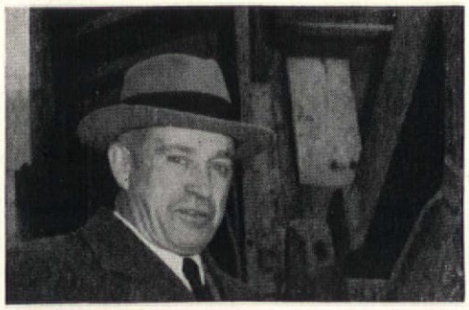
The architects instantly suggested a review of later advances in building materials even though brick was used as a low-cost material in setting a budget figure. They talked over glass walls, metal walls, flexible ceilings, windows cleanable from inside the building, lighting and electric flexibility, and other things. The problem was how to absorb these advances within a budget that had not been set up to include them.

The suggestion of metal walls in particular appealed to Galbreath, whose relations with the steel industry had been constant since he operated 525 Penn Place (the "steel" building) in Pittsburgh and built Fairless Town for US Steel Corp. He found that his friends in steel, alarmed by the amount of publicity that the aluminum industry had been getting through a succession of aluminum skin buildings, very much wanted this major building to have a steel skin as a showcase for the industry.

"And what about the added cost?" asked Harrison and Horr. Would not a stainless-steel skin cost half again as much as brick?

But the steel industry wanted the building, and cost was not going to prevent them from getting it. To meet the competition, they were willing to write off any price differential as the cost of promoting steel. Result: New York's biggest skyscraper in 25 years will have a stainless-steel skin.

The fact that everyone was working with only sketchy architectural drawings raised another "steel problem": how to be sure about the amount of structural steel needed?



HORR

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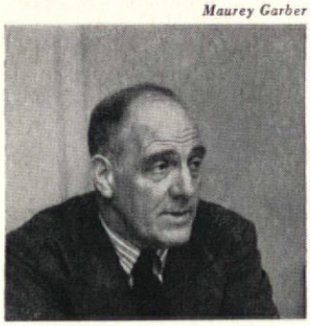
Maurey Garber



HARRISON

GALBREATH

RUFFIN

Yet, costs had to be set long before the final specifications were ready. If orders waited until the specifications were complete, costly delays would ensue in scheduling millwork. It was here that the contractor had to bank on his extensive experience.

While Turner's main problem was cost, pure and simple, Harrison & Abramovitz had to worry about designing a lush, high-style building that would entice the big tenants, big money and big landowners that Galbreath and Ruffin were after and still keep their plan within Turner's cost estimates.

The basic plans for the building hew pretty closely to Peterkin's original drawings. For 14 years he had been making a study of every phase of the site for the Goelet estate. Their ideas about the kind of building they wanted remained unchanged. Since the landowners liked Peterkin's concept, it was up to Harrison's staff to come in with a plan that would meet these de-

THE TEAM *continued*

mands, and add high styling.

The system was for Harrison or someone on his staff to submit a design; Peterkin did one independently at the same time; each took a look at the other's work and the best features of both were worked in. At first the decisions were made usually by Galbreath and Ruffin—after Turner's men had their say about cost. Later, as tenants came in, their desires became dominant.

To Harrison & Abramovitz, as architects for Galbreath and Ruffin, fell the ticklish task of giving brief sketches to engineers and contractors—and getting firm bids on them. In such a situation the architects had to reinforce their own skill by the choice and development of a well-knit team of engineers, structural, mechanical and electrical, who had all worked together closely with the architects and with Turner on previous buildings; among them were joint enterprises with Galbreath and Ruffin.

The architects closely and intensely discussed the design philosophy and structural pattern with the owners, based on past experience and on rental requirements, and after clearance set details of scheduling and the like. Tonnage estimates were talked out in concert with the builders to save time and to check on previous estimates made on a square-foot basis.

Edwards & Hjorth as structural engineers were asked if the planned column arrangement was workable and economical. It was, but there was one unusual problem. A 42nd St. kiosk of the Lexington Ave. subway had to be maintained during (and after) construction. To meet this condition, Edwards designed heavy steelwork to span the kiosk at the fourth floor and then hung the rest of the frame from it.

Engineering and imagination

Jaros, Baum & Bolles became the mechanical engineers. After Harrison suggested them to the owners, Alfred L. Jaros Jr. got a call from Peter Ruffin asking him to come in for a talk. The talk did not touch on Jaros' terms for doing the proposed work. Instead, Ruffin wanted to know about his previous work and his concepts of this job. Two weeks later, Harrison & Abramovitz asked Jaros to do a plan for the building's $10 to $12 million worth of mechanical equipment.

One of the greatest challenges Jaros faced was the air-conditioning engineering. At first, a 4,000-ton unit seemed to be indicated with one big chilled water piping system for the entire building (cost, about $50 a ft.).

Since stock units do not go over 2,500 tons, this would have entailed an expensive, custom-made job. Instead, Jaros worked out a plan for a stock 2,500-ton compression unit in the basement to serve the first 14 floors. Steam from this unit will rise to the roof (through the winter heating pipes), into a regulation water-evaporation air-conditioning system that will cool the upper part of the building.

The result: reduction in pipe costs; elimination of custom-made air-conditioning units; reduction of the total mechanical costs for heating, air conditioning and ventilation from the usual $5 to about $4.25 per sq. ft. Jaros estimates that this kind of imagination saved the owners as much as $750,000.

The same method of picking an engineer paid off for Galbreath and Ruffin in the field of electrical engineering.

The firm of Edward E. Ashley, consulting engineers, were asked by Harrison & Abramovitz to submit a plan for the electrical system. Faced with less-than-the-usual details to work from, Ashley's firm nevertheless submitted a brief idea of their plans and a firm statement of costs.

Tenants and volts

Once their plan was accepted, it was up to Ashley to come through. They assigned a young member of their staff, 29-year-old W. Frederick Schmidt, to the project. To Ashley, and to Schmidt, this big new building was a natural place for a big new electrical plan. The plan: a high-voltage system of 460 to 265 v. instead of the 208 to 120-v. plan normally used in offices (p. 88).

To Schmidt, a high-voltage system makes economic sense. Not only does it allow for the use of more generous electrical equipment, it also saves up to 20% in the cost of installing feeders (compared with the number needed for a 208 to 120 plan) because half the usual amount of copper and fewer switches and boards are needed.

Working with New York's Consolidated Edison and Westinghouse, who passed Schmidt's design through a 100,000 short-circuit test, Schmidt proved to the city building authorities that such high-power installations in an office building are safe, thereby getting the city wiring code amended.

Once the electrical engineering designs were completed, the problem arose of their installation. This was presented to Fishbach & Moore, electrical contractors, who had been doing plans for this site for four years. Board chairman Harry Fishbach and his vice president, Harry C. McNary, received only a typical floor plan, plus instructions that this had to be a high-class building. Using the UN and Chrysler East square-foot costs as their models, Fishbach's firm came in with an estimate. One piece of advice from the firm was to use a concrete, underfloor, two-duct system. But one of the prospective tenants, the American Tobacco Co., decided that their 175,000 sq. ft. needed a three-duct system.

There was no trouble selling the extra cost of additional electrical ducts to the tenants who were delighted to get a building at last that would service today's vast increase in automatic office machinery and be ready for future increases.

Originally, the plans called for a lighting fixture every 49′. But one tenant asked for one every 42′ and another was willing to pay for one every 32′.

According to Harry Fishbach, the building will be able to handle a 100% increase in load without any changes in the wiring.

Vertical transportation within the building received equally close attention. The firm that ultimately won the contract, Otis Elevator, was no stranger to this project. Sebastian Musset, Otis sales engineer for New York, recalls that as far back as 1948, they did plans for a building on this site that strongly resembled Galbreath's and Ruffin's. But, of course, automatic elevators were not available then. To Galbreath and Ruffin, the idea of operatorless elevators had a strong appeal. If they could do without operators for 35 of their elevators annual costs would be cut over $100,000. (This was particularly important because the major tenant required two more elevators than originally planned.)

Lack of exact specifications caused considerable trouble in deciding on the eventual "elevator" winner.

After much discussion of proposed systems, equipment and costs, a meeting of the architects, builder engineers and elevator companies was called to decide on the general type of equipment.

Although competitive bids were submitted, the contract was not awarded until after Socony-Vacuum, the major tenant, had called on Consulting Engineers Meyer, Strong & Jones for independent advice.

The elevator case was but one instance of the unusually strong voice that tenants had in shaping the building. They considered themselves as owners, fully aware that unless they agreed to long-term leases the real owners' plans would not come off.

This attitude was just one more factor that Ruffin had to cope with in getting his tenants and keeping them happy while charging them up to $7.50 per sq. ft. for space. His salesmanship was good enough to keep Socony-Vacuum from making a rumored move to the suburbs to join its sister company, Standard Vacuum, and to get them to take over 540,000 sq. ft. He also sold American Tobacco (175,000 sq. ft.) and Woolworth (a 45,000 sq. ft. of ground-floor store). And one of his financial backers, National City Bank, took a lease for a ground-floor branch and an office floor for a total of 100,000 sq. ft.

By the time financing was arranged, a building which was not yet completely designed was 90% rented to top-quality corporations, most of whom signed 25-year leases. All of the leases contain escalator clauses for rent increases if taxes and operating costs rise—a Goelet stipulation to assure revenues reflecting the property's real value.

Risks and rewards

Once Galbreath and Ruffin had lined up such substantial long-term tenants, financing came easily. The Equitable Life Assurance Society put up $37.5 million and National City Bank, $5 million.

Galbreath and Ruffin have also invested in the venture. They have had to put up $1 million to meet the cost of such preliminary work as buying out and relocating some of the tenants of the old buildings on the site (this particular operation cost Galbreath and Ruffin $125,000, a sum matched by the Goelets).

The rewards which will come to Galbreath and Ruffin as owners of this great new structure certainly make the game worth the candle. The 7,500 to 8,000 people who will work in its offices will probably never see more of the "game" than its end product—the apparently easily and smoothly constructed building. Galbreath and Ruffin and their team of building specialists could make a complicated and sensitive operation look that way.

Photos: (right) courtesy Standard Oil Co.; (below) Idaka

YESTERDAY—MAIN ST., NEW MARKET, VA.

THE ARCADE MAKES A COMEBACK

PREPARED IN
COLLABORATION WITH
FREDERICK GUTHEIM

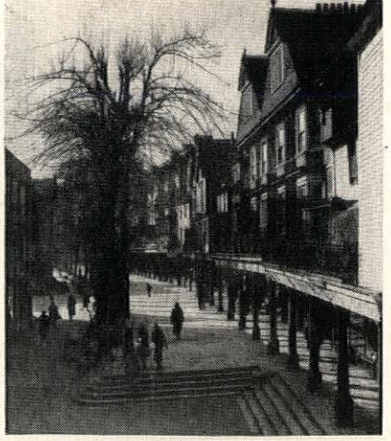
City planners and store owners are using it to widen streets and to bring downtown some of the advantages of the modern shopping center

TODAY—CONGRESS ST., CHICAGO

Pushing the sidewalks back under the buildings to widen four blocks of Chicago's Congress St. has revived one of architecture's oldest and handiest devices—the pedestrian arcade.

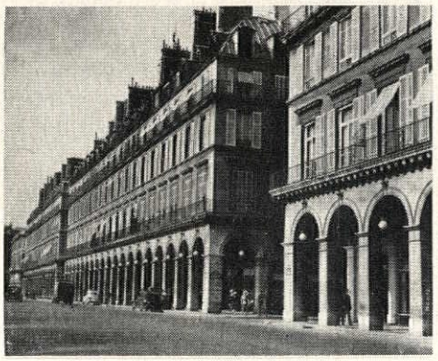
Arcading relieves traffic congestion by giving today's sidewalks to the cars and putting new sidewalks behind today's building line, thus yielding an added lane for vehicular traffic. Arcades also restore comfortable shade to walk in; they automatically free the sidewalks of rain and snow and burning sun; they even make store-window displays twice as visible and effective by providing a continuous canopy, removing sun glare and reflections from the glass; they change decisively the atmosphere of the sidewalk—within the well-designed arcade the pedestrian rush slows to a saunter, people are more easily halted before an attractive window display, the transition between

GALLERIA, MILAN

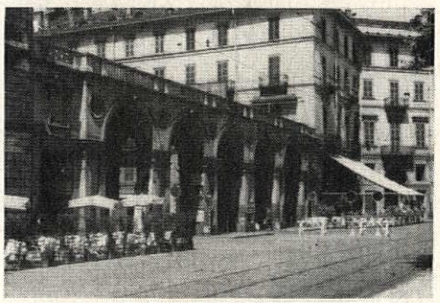


PANTILES, TUNBRIDGE WELLS, BRITAIN

CALLE FLORIDA, BUENOS AIRES



RUE DE RIVOLI, PARIS



PIAZZA CARLO FELICE, TURIN

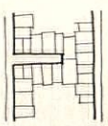
the outside and the inside of the shop is easily bridged.

Few laymen realize how feasible arcading is—under existing buildings as well as under new ones. The skeleton frame of most downtown buildings allows a passage to be opened in the front part of the building with only minor remodeling and little or no reconstruction. The $1,400 cost per front foot of the Congress St. job is a low price to pay for adding two lanes of traffic to the approach to the Loop's new superhighway.

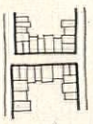
There are six kinds of arcades, each of which has made its mark in history:

The recessed arcade, the modern tool of street wideners, can be a feature of a new building, like the New York Telephone building (p. 96), or of remodeling like the Sears store on Congress St. in Chicago (p. 97). This is the commonest form of arcade, the type seen in the Rue de Rivoli or the Place des Vosges in Paris, or in more modern examples, such as London's Regent St.

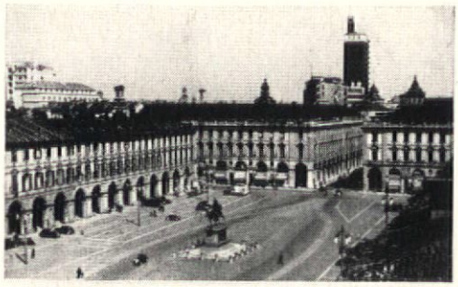
The continuous marquee has some of the advantages of the recessed arcade but in less formal terms. In places where excessive rainfall obliges some protection for shoppers, like Gray's Harbor or nearby Aberdeen (in Washington State); or where the sun blazes against building walls, like New Orleans; or for more general reasons, like the lounging informality of the Shenandoah Valley town of New Market, Va. (photo, p. 93)—here the arcade in its primitive form has sprouted easily, with all its opportunities for the easy display of merchandise and the encouragement of sociability.



The dead-end arcade offers still other advantages. Like the typical nineteenth-century shopping arcade, it is a means of increasing the value of buildings by offering more shop frontage and capitalizing on the fact that one merchant sells to another's customer when given the opportunity. The Providence Arcade (photo, above), built in 1828, shows that the Yankee shopkeeper was no less adroit at this than his British cousin. A limited frontage on a good shopping street can often be increased by judicious arcading extending the "address" into the interior of the block.

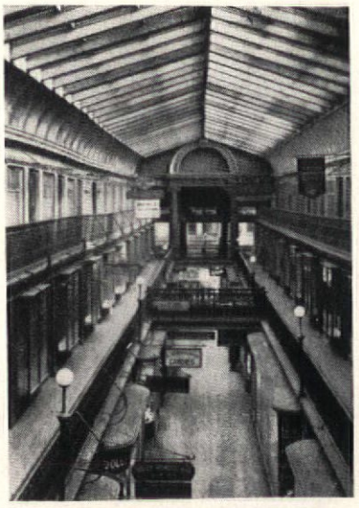


The cut-through arcade in its many forms is a step-saver, and step-saving is a sure way of building up the pedestrian count in front of shops, although it is also harder to sell the man in a hurry who wants to get somewhere else. Railroad-station shopping arcades are of this type, the lower levels of Grand Central Station in New York being a large-



PIAZZA ST. CARLO, TURIN

Photos: C. Mydans; J. Modlens; Insolera; British Information Service; LIFE*—T. D. McAvoy; courtesy Standard Oil Co.*



ARCADE, PROVIDENCE, R. I.

VIA ROMA, TURIN

VIA PO, TURIN

VIA ROMA, TURIN

ROYAL ST., NEW ORLEANS, LA.

scale instance. Usually the cut-through begins by subdividing a very large block. London's famous Burlington arcade is based on this strategy. William Zeckendorf toyed with an idea of this sort in New York City for the unusually large block west of Fifth Ave. and north of 34th St. in the highly competitive retail shopping zone there. And in his new building between 33rd and 34th Sts., Woolworth has rented a store which serves as a big arcade between the doors of Macy's and Gimbels. Arcades in places as widely separated as Ann Arbor and Calgary owe their origin to the same motive. The famous Milan Galleria is essentially a pedestrain trap of this sort, connecting two of the city's most densely used squares.

The diversionary arcade also developed from the strategy of luring the pedestrian. It may not offer a shorter way from point to point, but it seems more advantageous for various other reasons: better light, shelter, more things to look at or do en route. The vicinity of a transportation terminal of any sort is an excellent location for such an arcade. Often the superior attraction of the arcade can be traced to its way of modifying space, giving it a different quality. Architect Louis Kahn once suggested this in a definition of a railroad station: "A street with an enclosure around it."

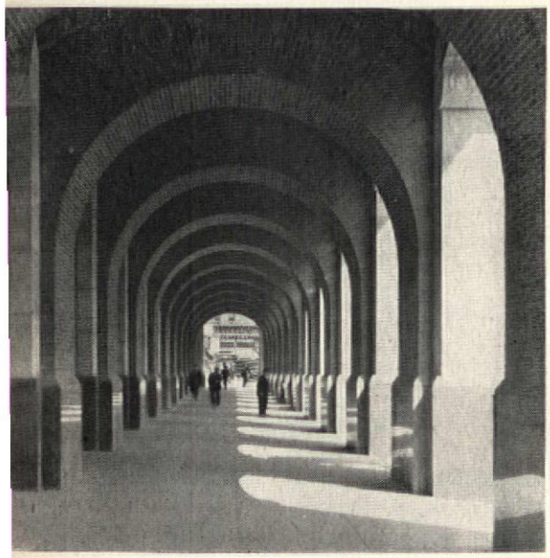
The pedestrian island, the ideal of the shopping center designer, is often hard to distinguish from an arcade in the ambulatory sense. One of the finest examples of an informal area of this sort is the Pantiles in Tunbridge Wells, England. The conventional European market in a town square (often arcaded), where canvas and sticks give temporary shelter to goods and shoppers and the whole area is flushed down at night, is the prototype of the more deliberate pedestrian areas of today's redevelopment projects. Street closings and the chance to treat the commercial area thus created as a pedestrian zone from which traffic is excluded may be formally declared with fences or bollards, or merely by prohibiting traffic during certain hours (as in the Calle Florida, one of Buenos Aires' busiest streets—photo, opp. p.). During lunch hours Nassau St. in downtown Manhattan becomes a pedestrian street. Not only such special areas themselves, but their approaches, offer opportunities to merchants.

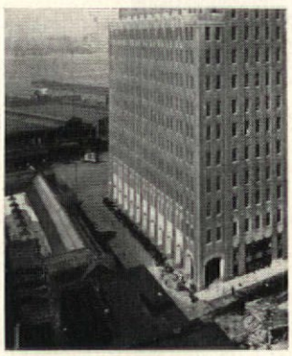
All these types of arcades aim at values that may be provided by the new or the remodeled building, by single structures, or large-scale urban planning. Designers of shopping centers have realized better than other architects the opportunities which lie in arcading. On the following pages are three examples of how the architects of the expanding world of the pedestrian are beginning to apply these lessons on a larger scale.

Three arcades of more recent vintage make way for vehicular traffic and pedestrian shoppers

BEFORE

. . . today, four blocks of arcades





The widening of Congress St. in Chicago became necessary to provide an adequate connection between Michigan Ave. and the Congress St. superhighway leading west from the Loop. Arcading offered the cheapest and best way of accomplishing this.

When highway engineers found the Congress St. superhighway bottlenecked between State St. and Michigan Ave., they faced one

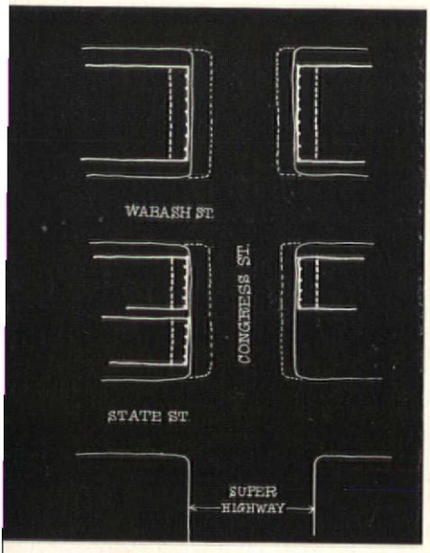
In 1933, an arcaded sidewalk helped New York widen a downtown street . . .

Thirty-two years ago the New York Telephone Co. building met the need for street widening with an arcade which allowed the full use of the site for building purposes and turned former sidewalk space into street. All this at a time when city planners everywhere accepted calmly the need for a huge volume of street widening at exhorbitant cost. This solution recommends itself today.

The crowded approach to the Lackawanna Ferry on Vesey St. had suggested the need for widening this street from about 56′ to about 79′. This was the solution proposed by the city at the time the telephone company was planning its new building. The company countered by proposing this deal: "If the city would consent to abandon the proposed change in the street width, the company would consent to the construction of an arcade through the building with a sidewalk width of 17′ and a height of at least 18′, the effect of which would be to permit widening of the roadway from 30′ to about 44′ through inclusion within its lines of the sidewalk now in use on the northerly side of the street." This suggestion was accepted. Result: for a legal consideration of $1, the city was able to widen the vehicular roadway 14′ in a high land value area.

The arcade extends the entire length of the Vesey St. side of the building. Although the arcade was planned by Architects McKenzie, Voorhees & Gmelin in terms of attractive shopping fronts, the demand for office space by the telephone company has precluded such use. However, two busy employment offices of the company have entrances from the arcade. Twelve arches at intervals of 20′ compose the arcade with one shopping front for each pair of arches.

If he was not the originator of the idea for the arcade, Arthur S. Tuttle, then chief engineer for the Board of Estimate, became one of its most enthusiastic champions. Long concerned with means of relieving congestion in New York City, Tuttle believed that arcades of this type furnished one of the best remedies. Few examples of such arcades have actually been realized. Why? In the case of new buildings arcades are feasible only where they fit into special cases, like the telephone building, or where provision is made for them in a reasonably comprehensive long-term city plan. While arcades are seldom cheap, they offer a better bargain to private owner and municipal authorities alike where joint action can be developed. New York Architect Robert C. Weinberg recently studied these aspects of arcading before offering it as a solution to the widening of Eighth St. in Manhattan without excessive cost and destruction of abutting property. His chief illustration: the telephone building.



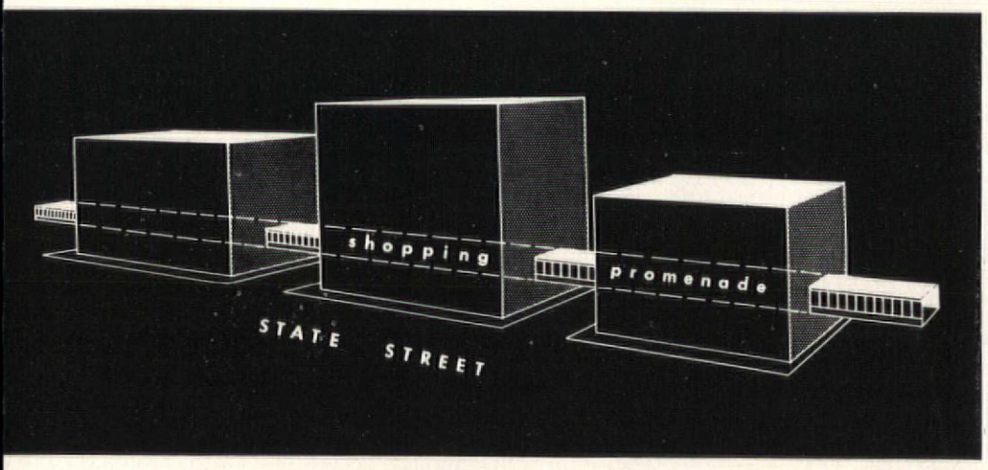
AFTER

are giving Chicago a wider Congress St. . . .

of the most expensive widening jobs in their experience. Six major buildings from 4 to 18 stories high pushed their way out into the proposed street. They included a department store, a hotel, a bank and a college. And they included Louis Sullivan's famous massive auditorium building, now occupied by Roosevelt College.

Engineering studies directed by Dick Van Gorp of the municipal department of public works showed that the most economical way to acquire the necessary 25′ of roadway was by incorporating the existing sidewalks on either side in the new roadway. New sidewalk areas were to be provided by arcading the buildings. This is now almost complete.

The Congress St. arcade is 18′ wide and 12′ high. It aligns with conventional sidewalks on Congress St. Finished in polished stone, the architectural treatment (photo, right) is dry and conventional but its practical value cannot be denied. While all costs will not be in until the sixth section of the arcade is let to bid, construction costs of the first five have averaged about $1,400 per front foot on top of a total land acquisition cost of $1,034,941.



. . . and tomorrow, Chicago's arcades may go upstairs to take pedestrians off the sidewalks

Chicago's proposed *elevated* arcade, a pedestrian route above traffic level, would be a shopping promenade running through seven blocks of the heart of State St.'s department stores. Still in the project stage, the city planning commission hopes it will be adopted in many congested commercial districts to improve internal circulation.

The promenade would run through the stores and cross streets on enclosed bridges. The principal direct costs of the scheme would be for the pedestrian bridges—estimated at $50,000 each. Within stores the promenade would take the form of especially wide aisles or arcades to provide a continuous walkway from Marshall Field to Goldblatt Brothers (and perhaps on to Sears at Congress St.).

Much of the appeal of this proposal stems from Chicago's overcrowded Loop sidewalks, with curbs filled with pedestrians waiting for a green light, moving from store to store exposed to the weather. Instead, the promenade offers the shopping center solution: a pedestrian island, a gala atmosphere, fresh opportunities for the display of merchandise, and easy customer interchange among stores.

US BUILDING ABROAD:

Studio R. R. Prabhu

In doing its share of a $100 billion postwar job,

the building industry has become a world-wide ambassador

The year 1955 finds the US building industry hard at work in almost every country of the free world. Our architects and planners are creating whole new towns from teeming India to tiny El Salvador. Our engineers and contractors are building new dams and power plants in Turkey and Afghanistan, new refineries in Sumatra and Ceylon, new highways in Colombia, new hospitals in Iran and Peru. We have opened gleaming new embassies and consulates in a dozen capitals, big luxury hotels in a dozen more.

What is the significance of this tremendous activity?

First, it means we are building up the basic welfare of other nations, creating climates unfavorable to communism, readying countries for industrialization and democratic independence, making them prosperous enough to buy more of our products.

Second, our industry and commerce are expanding in search of new sources of raw materials, new markets for finished products. To serve increased travel and trade, hotels and stores are springing up along the new commercial routes.

Third, we are helping build defenses for ourselves and our allies.

And fourth, we are keeping up strong governmental and public relations through our official missions: new embassies, consulates, libraries, information services.

In this vast development of the world community our planners and builders have ranged far and wide. In spreading wealth and knowledge they have also learned a few things about other climates, methods and materials —and other peoples. The best of them have learned how to be teachers, welfare workers, grass-roots ambassadors. Working closely with local government, professions, management and labor, they have been making friends—or, alas, sometimes enemies—for America in every country they have entered. Most have given a fairer picture of America than the picture painted by communist propaganda (and by some of our own Grade-B movies and Grade-B tourists). In many cases they have been able to show in concrete and steel that the kind of system practiced in America produces not only wealth, but technical and administrative abilities as well, and the willingness to share these assets with others.

On the following pages, FORUM presents, for the first time in a broad panorama, some of the best examples of jobs designed, financed or built by the US around the world. These structures, and the men who made them, are the face of America abroad.

But, first a summary of the over-all program, its financing and its accomplishments:

ECONOMIC AID. By late 1948, thanks to the Marshall Plan, Europe fairly crawled with members of the US construction industry. Architects went abroad to advise on the planning of industrial plants and housing, to give the benefit of their experience in expanding the US wartime industrial machine. In the early stages of the Marshall Plan—or until their local counterparts had time to bring their techniques up to date—US architects advised on better than half of the projects. In some of the less industrialized countries, US engineers are still being asked to draw complete plans or advise on locally produced schemes.

In the field of power facilities, the giant $116 million hydroelectric project in Greece—one of the biggest power jobs attempted under any aid program — was designed and supervised by Ebasco Services, Inc. Most of the cost came from local currencies, partly to pay for domestic workers and partly to pay for European materials and equipment used in the project (some of which came from factories built with Marshall Plan money). But Ebasco's receipts from the job, $13.8 million on a cost-plus arrangement, came out of US aid money allotted to Greece.

With the exception of the construction superintendents, the project engineers and some highly skilled equipment workers, Ebasco used mostly Greek personnel. Further, by the time the job is completed, Ebasco will have sent local citizens back to the US for training to operate and maintain the project.

An example of the kind of project stimulated by the combination of US aid and advice from US specialists is the housing program carried out in six western European nations. In just four years (1948-1952) the equivalent of almost $750 million was spent on housing projects in England, France, Italy, western Germany, western Austria and the Netherlands. All of the money came from counterpart funds.

In one area, the Ruhr Valley, this effort paid for eight housing projects for miners. Under the guidance of a special housing mission set up by the Marshall Plan (headed by James Butler and directed in its early stages by US Architects William Wittausch and Vernon DeMars, and later by Bernard Wagner), 15 teams of German architects, engineers and developers submitted plans and costs for the proposed units. Winning teams, awarded contracts to carry out their plans, used German workers, equipment and materials, and built the projects at a saving of up to 20% under usual construction patterns in the area. The program also introduced to this part of Europe a form of US installment home buying.

MUTUAL SECURITY. Most of the $15 billion in military aid extended so far to Europe has been paid out in the last three years. The US construction industry is part of this operation, too, since most new European installations are joint efforts of the North Atlantic Treaty Alliance.

Thus, military bases in Europe and North Africa have been designed and constructed on a cost-plus basis by US engineers and contractors with some of the contracts awarded by the Army Corps of Engineers, some by the Navy's Bureau of Yards and Docks, and a few by similar agencies of foreign governments.

Payment for the work can come from any one of three different sources (or a combination of all three): US

foreign military aid funds; defense allotments of the US Defense Dept.; or foreign-subscribed NATO funds.

In the six-year period, 1950-1955, the engineers will have supervised construction of $1.8 billion worth of bases, barracks and similar military services in western Europe, North Africa and the Middle East. Much of this work has been done by US heavy construction firms such as Morrison-Knudsen Co., who had $185 million worth of foreign contracts outstanding in 1953.

These are good reasons why the work is done on a cost-plus basis. Every job is different; what the architects and builders learn in one country may not do them any good in another because of political, economic and climatological reasons. Then too, turnover of construction workers is high, sometimes running 40%, and the cost of shipping men and equipment is far greater than on domestic jobs. (M-K spent $15 million on transportation alone during 1953.)

LOAN PROGRAMS. Export-Import Bank loans have played a particularly important role in developing foreign power and transportation industries but they also have been widely used to build and equip many manufacturing plants in Latin America and Asia.

The equipment for Export-Import Bank loans generally comes from the US and the plant is usually designed and built by US engineers and builders. In many instances the actual construction is carried out in conjunction with a local firm but, in any case, most of the more highly skilled workers are recruited from US construction crews while most of the unskilled labor is performed by local employees. One of the distinctive features of these operations, however, is the training of native workers to do the more difficult work. Sometimes when a US crew departs from an area, it leaves behind what becomes the nucleus of a small construction company, manned almost completely with men who have received their training on the job—from engineers to bulldozer operators.

POINT FOUR. American advisers employed by Point Four have gone out in small teams to set up such projects as model farms in India and health programs in Iran, but money from this program has also paid for things like the two-year technical and economic survey supervised by the engineering firm of Knappen, Tippetts, Abbett, McCarthy for the government of Burma.

In some instances, the various US aid programs overlap. For example, in Afghanistan, a $75 million project calling for the construction of two dams was largely financed with Export-Import loans while Point Four technical assistance to the same country has been showing previously nomadic Afghans how to use the 400,000 newly irrigated acres that the dams will create.

This project, begun back in 1947 by Morrison-Knudsen, is just winding up and is typical of the kind of operations that US firms find themselves in when they work on aid projects. Examples: 1) M-K used 60 local workers for every US national employed and had some unusual problems to contend with as a result. For instance, the Afghan version of the coffee break consists of two prayer periods each day on company time in addition to three prayer sessions on the workers' own time. 2) The transportation difficulties were enormous and getting 17,000 tons of equipment into the middle of this backward Asian nation accounted for about 25% of the project's cost. 3) Despite the Point Four work in Afghanistan, M-K found it necessary to start its own model farm in one area just to show local farmers how to use the new land—certainly an unusual venture for a construction crew.

In addition to the aid programs carried out by the government and the technical assistance done by the big private firms in connection with their profit-making work, some US citizens, notably the Rockefellers, have established what could be called "private" Point Four programs. The Rockefeller's International Basic Economy Corp. (IBEC) has been trying to improve the economy of several Latin American states. Among other things, IBEC has introduced the supermarket technique of food distribution, opened farm machinery and food processing plants and engaged in town and regional planning.

PRIVATE INVESTMENT. Despite some obvious deterrents, private investment abroad is big. At the end of 1953 it totaled about $17 billion, up $10 billion from 1946. The graph and table (right) show that the manufacturing industry is the biggest of the private investors ($5.2 billion by 1953) and that the Latin American countries get the biggest share of the private investment dollar—about 37%.

Not all these private dollars go into industrial plants. For example, in building its Batangas Refinery in Indonesia, Caltex (California Texas Oil Co.) has had to put up mosques, schools and housing and provide virtually all the services a municipal government would supply at home. Similarly, Aramco (Arabian American Oil Co.) has pro-

A summary of the programs which have carried US building abroad

In the last 15 years the US has developed a series of programs, both public and private, that have put its architects, engineers and builders into almost every corner of the free world.

Following is a year-by-year and dollar-by-dollar summation of the most important of those steps:

LEND-LEASE. Started in 1940, this program was designed to give the allies the military hardware they needed to overcome the axis. Before the program ended in 1945, the US had spent $48.7 billion in the effort ($8 billion of which came back in reverse lend-lease after this country entered the war.

UNRRA. Destruction was the residue of the war and the US felt compelled to develop an aid program to alleviate human suffering. Under the United Nations Relief and Rehabilitation Administration (as the program was called), the US spent $3.5 billion in less than three years to feed, clothe and at least temporarily house the victims of war.

BRITISH LOAN. To pay its war bills, Great Britain liquidated great chunks of its foreign investments. To help the United Kingdom restore its shattered industrial empire and become a strong ally once again, the US loaned the British $4.4 billion in 1946.

MARSHALL PLAN. Just as Europe began to show signs of a start at recovery, a new enemy—communism—appeared and begain exploiting low living standards. The Marshall Plan was the answer. In its early stages, the program included large grants for foods, fibers and fuel. But, even at the start, the Marshall Plan had as its prime goal the raising of western Europe's productive capacity. This meant new factories, additions to and renovations of old plants, construction of power facilities and a host of related industrial projects.

The Marshall Plan—or its successors—required the expenditure of $15 billion by the US. It was the first aid program in which the US construction industry played a major role.

COUNTERPART PROGRAM. As a condition for receiving Marshall Plan funds, each recipient nation was required to put up a specified amount of its own currency in a fund to be used for roughly the same purposes as the dollar grants. To date, counterpart funds have amounted to more than $1 billion.

EXPORT-IMPORT BANK. Since 1945, this government bank has loaned over $3.5 billion to nations all over the world, mainly to finance projects that private investors shied

vided schools and health facilities for native workers and houses which they can buy on the installment plan. It also has established an "Arab Industrial Development Dept." to ease the growing pains of Saudi Arabia, opened industrial training schools for 7,500 Arabs and let contracts with 700-odd native suppliers for everything from ice and laundry services to furniture and auto repair.

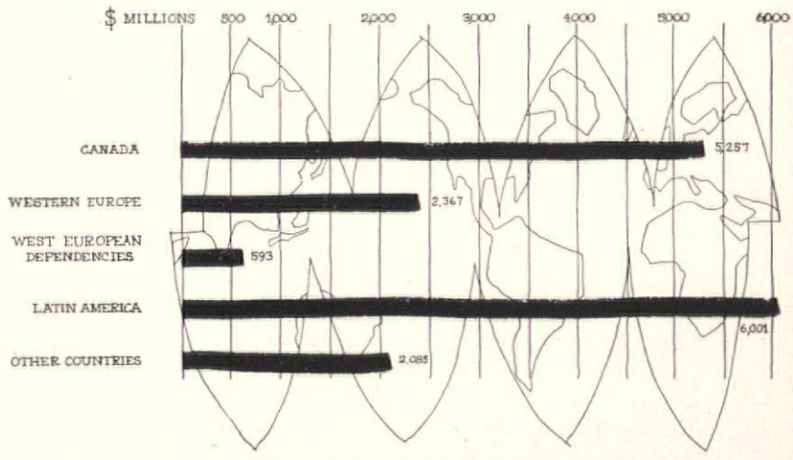
In the field of manufacturing and assembly plants, General Motors is probably the leader of all US investors abroad with its 27 plants in 17 nations and its $191 million expansion plan for Europe alone. Other fields are marked by other blue-chip investors: Pan American (through Intercontinental Hotels) with its 15 foreign hotels, *Reader's Digest* with its publishing plants in 14 countries, E. R. Squibb with 17 factories around the world and Coca Cola with its ubiquitous bottling plants.

HOW BIG THE FUTURE? Although the scope of our private operations abroad seems large, it is actually small when measured against the undeveloped state of most of the world and the prewar investments made by Britain when she occupied our present position as leader of the Western Alliance. If, as Britain did, we were to put 2.5% of our gross national product into foreign countries, it would mean stepping up our present rate from less than $2 billion to $5 billion per year.

What are the chances of our reaching this figure? No quick or easy answer is possible, but, based upon postwar experience to date, certain facts are obvious. While it will meet keener local competition, US industry should continue to flourish in such newly prosperous countries as Britain and west Germany. In other countries not so far along the road to recovery, government aid programs will continue to stimulate growth and thereby open new markets for private investment and private construction. This trend may be abetted by an International Finance Corp., a proposed adjunct of the World Bank, whose $100 million fund would help finance private industrial development in retarded areas.

Asia alone holds a big potential market for US construction, but the extent of our government aid to this continent is yet to be decided by the newly formed Council of Foreign Economic Policy.

On the other side of the ledger must be listed these hard facts which may tend to curtail our construction operations abroad: 1) European countries will capture a growing share of the foreign construction market; their



PRIVATE INVESTMENT ABROAD amounted to $16.3 billion by 1953. Graph (above) shows that bulk of it has gone into South America; table (below) shows that manufacturing industry has been biggest investor.

$ millions	1953	1950
Agriculture	658	589
Mining and smelting	1,934	1,129
Manufacturing	5,242	3,831
Petroleum	4,931	3,390
Public utilities	1,499	1,425
Trade	1,046	762
Other	994	662
Total	16,304	11,788

Source: US Dept. of Commerce; Office of Business Economics

equipment manufacturers can offer longer term credit than the US competitors—thanks to their more generous government-backed loan programs, and they will take business away from US competitors because the contracts for the design and construction of plants usually go to the same nation that supplies the equipment. 2) Many European nations, unlike the US, are now willing to take payment in soft currencies. However, as these nations get closer to currency solvency, this problem will become less acute. 3) Whereas currency exchange problems have prompted US firms to plow back their foreign earnings in new plants and equipment, the growing opportunity to withdraw their profits may curtail plant expansion. 4) Russia is extending its efforts to beat the free nations to the foreign market.

On balance, these deterrents are more than offset by the simple truth that the world economy is growing fast and that the US will continue to sell a fair share of that growing market. Thus, US architects, engineers and contractors can look forward to more and more work abroad. And, as long as the US continues to play wisely its role as a major world power, the industry's role will continue to be that of ambassador as well as builder.

away from because of low profit possibilities. Usually, these same projects had to be established before profitable ventures could be attempted by private investors. The International Bank for Reconstruction and Development (World Bank)—to which the US as well as many other nations subscribe funds—serves much the same purpose. In the absence of any large-scale aid program designed specifically for Latin America, the Export-Import Bank and the World Bank have supplied most of the public money going south of the border.

POINT FOUR. In many cases, nations which we feel need our economic assistance are in such a backward state that they cannot qualify for Export-Import Bank loans. This is where the Point Four program enters the picture, designed as it is to lay the groundwork for future industrialization by increasing the food supply, improving sanitation and—in some cases—educational and housing facilities.

Since it began in 1949, the US government has spent less than $250 million on Point Four. Private citizens have engaged in similar overseas programs. Outstanding among these is the Rockefeller International Basic Economic Corp. (IBEC), which has tried to improve the economy of several Latin American nations by introducing more advanced techniques in the fields of agricultural, retailing and town planning.

Another aspect of private Point Four work is carried out by the big oil companies in and around their foreign fields and refineries. Since their work takes them into backward nations, they have found it necessary to build whole cities and provide educational, housing, health and municipal services for their workers and their families.

MUTUAL SECURITY. At about the same time that the Korean war started, it became apparent that economic assistance to friendly nations was not enough. Once mainly an internal threat, communism became an external one as well. To counter this, the US embarked on the Mutual Security military aid programs. To pay for the bases, arms and men needed for the defensive side of the alliance, the US has paid out $15 billion since 1951 and the program is still going on.

PRIVATE INVESTMENT. Despite the uncertainties of world politics—tangibly expressed in the very need for huge aid programs—the US private investor has, in the postwar years, been willing to invest more than $10 billion abroad.

DEVELOPMENT: NEW RESPONSIBILITIES

Helping underdeveloped nations realize their potentials has kept US architects, planners and builders busy on some of the biggest jobs of their careers: overhauling entire national economies, building new dams to create farmlands and power for industrialization; laying out new highways, tunnels and bridges to link scattered areas; building new harbors and airports to lure world trade, new housing, schools and hospitals to raise low standards of shelter, health and education.

Quite naturally a lion's share of this work has fallen to heavy engineering and construction organizations; but the impact has been at least as strong from the deeply humane enterprises of individual professionals. Among these, we find Mayer & Whittlesey, as architects and planners, doing the basic plans for Chandigarh, major capital of Punjab, India; Neutra and Alexander laying out a $25 million plan for rebuilding devastated Guam; Alexander with Indian Architect Sarma, planning under UN auspices a new "rural city" for 60,000—"Pallikkarana" in Madras State; Jacob Crane heading rural-tropical housing studies in southeast Asia; dozens of others working away quietly, as did Albert Mayer living in Indian villages to study how they could win improvement.

Contrasted with this work is the effort of vast engineering organizations such as Knappen-Tippetts-Abbett-McCarthy of New York, involved during the past five years in planning for $3.7 billion in overseas projects in 12 different countries.

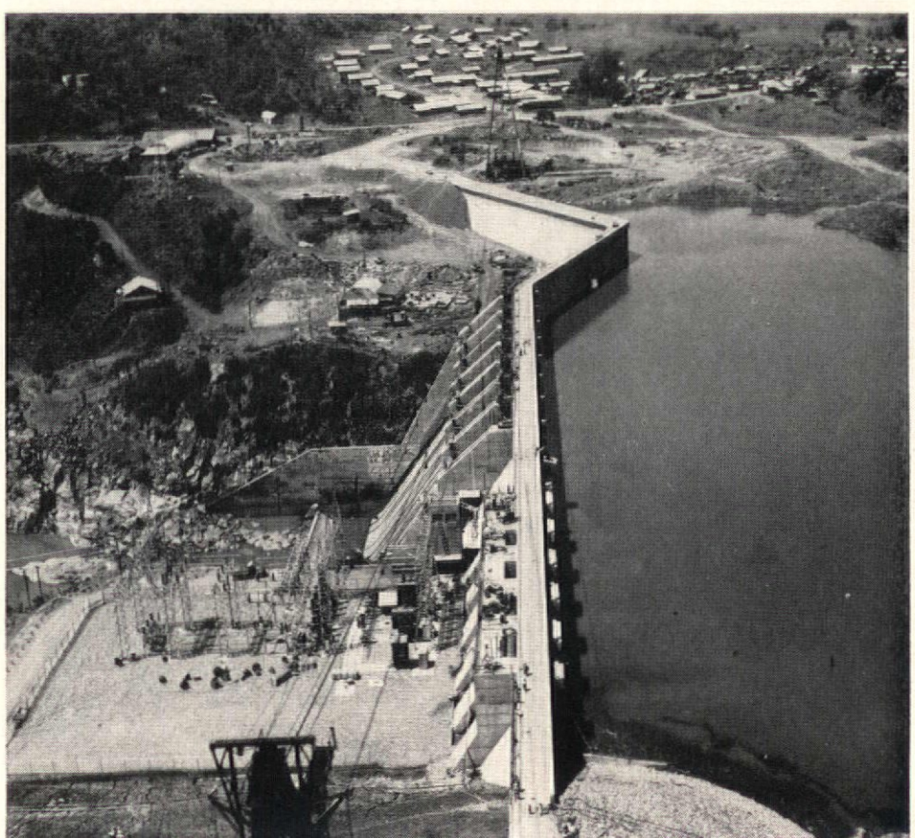
Three years ago KTAM, assisted by Robert Nathan Associates (economic consultants), Pierce Management (mineral experts) and $2 million in Point Four aid, launched an all-inclusive economic, social and engineering survey of Burma aimed at doubling gross national production by 1959. Their $1.5 billion plan calls for huge irrigation and power projects (two of which KTAM is now designing), rail, highway and communications networks, new port facilities, new mining and industries. Elsewhere in backward Asia KTAM is working on a $555 million project to reclaim Iraq's Tigris-Euphrates valley and make it bloom with crops enough to feed the entire population of 5 million. In Korea they are consultants to the United Nations on a $130 million rehabilitation program including three thermoelectric power plants being built by Bechtel Corp. of San Francisco to double the nation's power capacity. KTAM has been working on other power and irrigation projects in eight other countries.

Big Builder Morrison-Knudsen of Boise, with $560 million in overseas contracts completed since the war, has carried out $50 million in dam and irrigation contracts for the Afghan government, an earth-fill dam in Ceylon to double the island's water storage and provide new plots for 20,000 farmers; by 1957 they will complete a power dam for the city of Teheran.

Photos: (below) UP; (opp. p.) LIFE—William Sanders

BOLIVIAN HIGHWAY (right and above) now links two halves of a nation split by the Andes mountains. Helped by Export-Import Bank loan, engineered by KTAM and built by Macco-Panpacific of Los Angeles, the $45 million, 312-mi. life line joins the food-producing plains with the populous tin mines of the Altiplano, also closes the last gap in a 2,000-mi. road and rail system across the continent. US engineers and contractors have built roads in Colombia, El Salvador, Belgian Congo; tunnels under Havana Bay and through New Zealand mountains; harbor facilities in Guatemala, Australia, Liberia, Thailand.

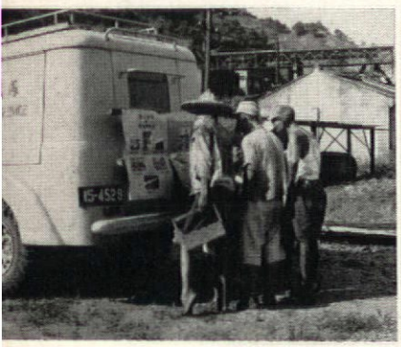
INDIAN POWER PLANT at Bokara is one of the first projects undertaken by the Damodar Valley Corp. in a five-year plan to irrigate 1 million acres and distribute electricity over a 250,000-sq.-mi. area in northeastern India. Designed and built by International General Electric Co. of India, with Harza Engineering Co. of Chicago, the hydroelectric plant is India's biggest power station. Elsewhere, power programs include four new plants in Greece built under supervision of Ebasco Services, Inc., who have also done power jobs all over South America and have designed and built India's first newsprint mill. Last year Stone & Webster completed Brazil's largest thermoelectric power plant near Sao Paolo with the help of a World Bank loan. Kuljian Corp. of Philadelphia are building the first two units of a $45 million power plant near Caracas, Venezuela.



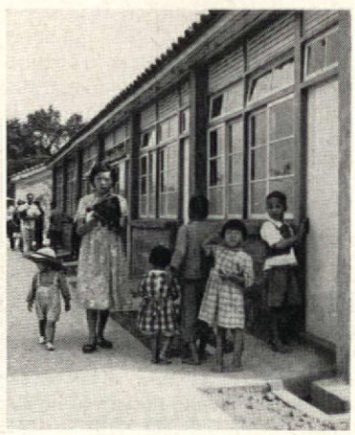
SALVADOREAN DAM completed last year lights the streets of San Salvador, will help the coffee-dependent country broaden its industrial base and irrigate some of its 72% of uncultivated land. Project was partially financed with World Bank loan, designed by Harza Engineering and built by J. A. Jones Construction Co. of Charlotte, N.C. Harza has also planned power-irrigation projects in India, Jordan, Iraq, Surinam, Uruguay and the Philippines, is working on complete development of the Meric-Evros River basin on the Greek-Turkey border.

LOW-COST HOUSES with reinforced concrete frames are replacing entire communities wiped out in Salvador's 1951 earthquake. Regional rehabilitation of five towns is IBEC Housing Corp. project under Architects George Dudley, Edward Echeverria, and Planning Consultant Robert Burlingham.

BETTER HOUSING is a basic mission of the US abroad, both officially and unofficially. Under technical cooperation programs, there are currently some 40 US housing specialists working in the field on projects financed by the Foreign Operations Administration. Two recent programs are shown below, one in highly industrialized western Germany, the other in lesser-developed Formosa. Others include a survey of housing legislation and building techniques carried out by The Architects Collaborative for Costa Rica, assistance to Colombia by the Small Homes Council of Illinois University, advisory work in Burma, Italy and the Middle East. Among the unofficial programs are those in Puerto Rico (1,800 $6,000 houses and community facilities) and a 2,000-house, four-year plan for El Salvador (photo, left), both initiated by the Rockefellers' International Basic Economy Corp.

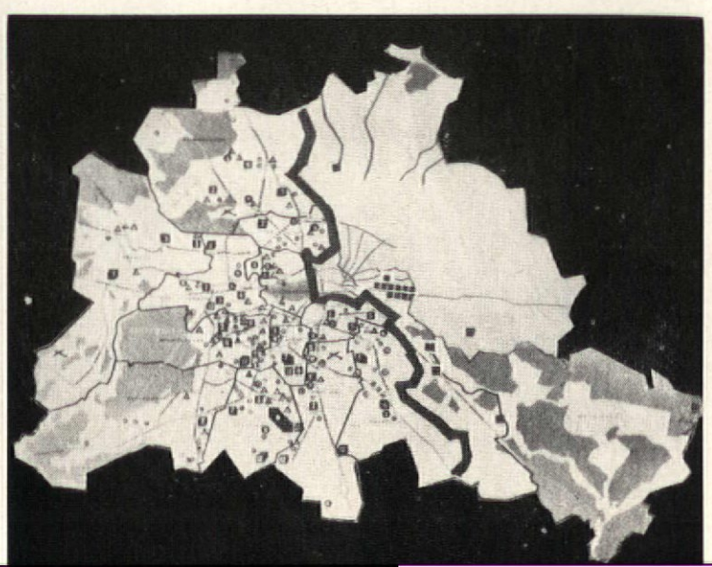


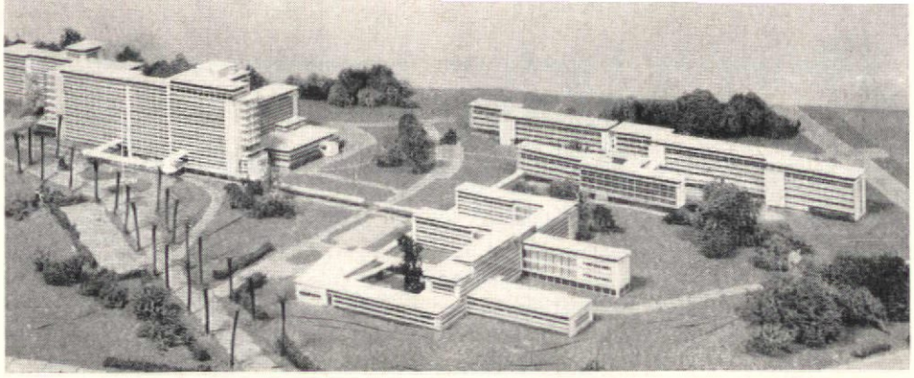
SOUND TRUCK, movie, exhibits and a soil-cement blockmaker demonstrate FOA self-help housing program to Formosan coal miners and dockworkers. Right: finished houses. Mobile unit first went on the road last August, has helped relieve critical housing conditions among refugee population.



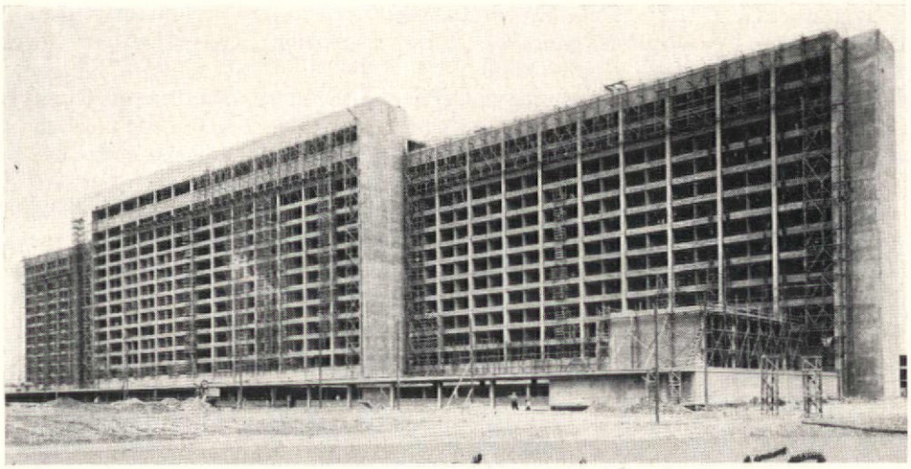
MAP OF BERLIN (below) shows how US-guided housing has sprung up where needed all over Western zone, while in Eastern sector 90% of all new housing has been state-directed into grimly monumental "showpieces" along the Stalinallee (symbols represent 30 to 200 dwelling units each). Beside housing 190,000 refugees from the Soviet zone FOA is currently building an answer to Stalinallee: the 1956 Berlin International Building Exhibition, a complete redevelopment of a bombed-out area north of the Tiergarten with 8,000 permanent dwelling units shown in various stages of construction, architectural exhibits, festive pavilions and cafés in a landscaped park.

IN NINE RUHR CITIES, counterpart funds and FOA technical assistance under US Housing Specialist Bernd Wagner have produced 5,337 row-house homes for coal miners, plus good will and increased coal production. All were designed and built by Germans, with Americans introducing competitive bidding and a FHA-type installment purchase plan. Above: row houses at Aachen.

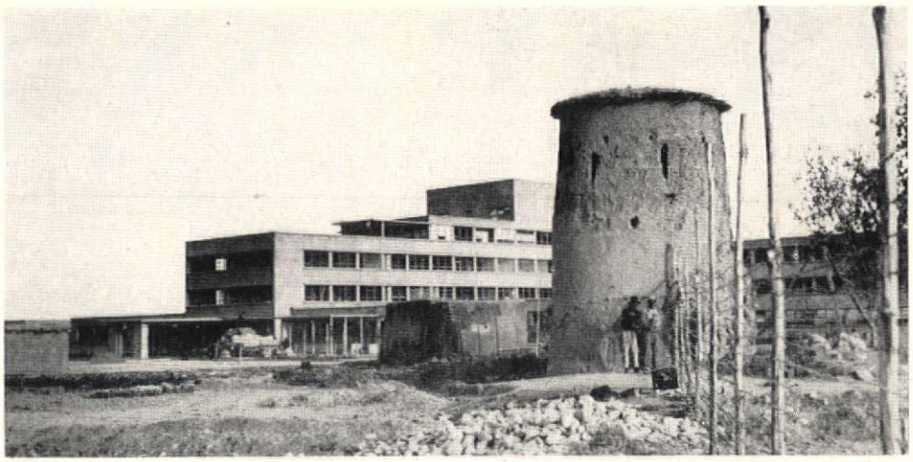




MODERN HOSPITALS for underdeveloped countries have been greatly aided by US architects and engineers and the US Public Health Service. At left is the Union Central Medical Center in Rangoon, biggest of nine hospitals designed by Litchfield, Whiting, Panero & Severud, architects and engineers, and paid for by the Burmese government. An Indian contractor has started foundations on the $11 million project, which includes a 600-bed hospital, 200-bed TB center, medical school (500 students), nursing school (400 students) and residences. Buildings are oriented, shaded, throughvented for climate control, designed for local materials and methods.



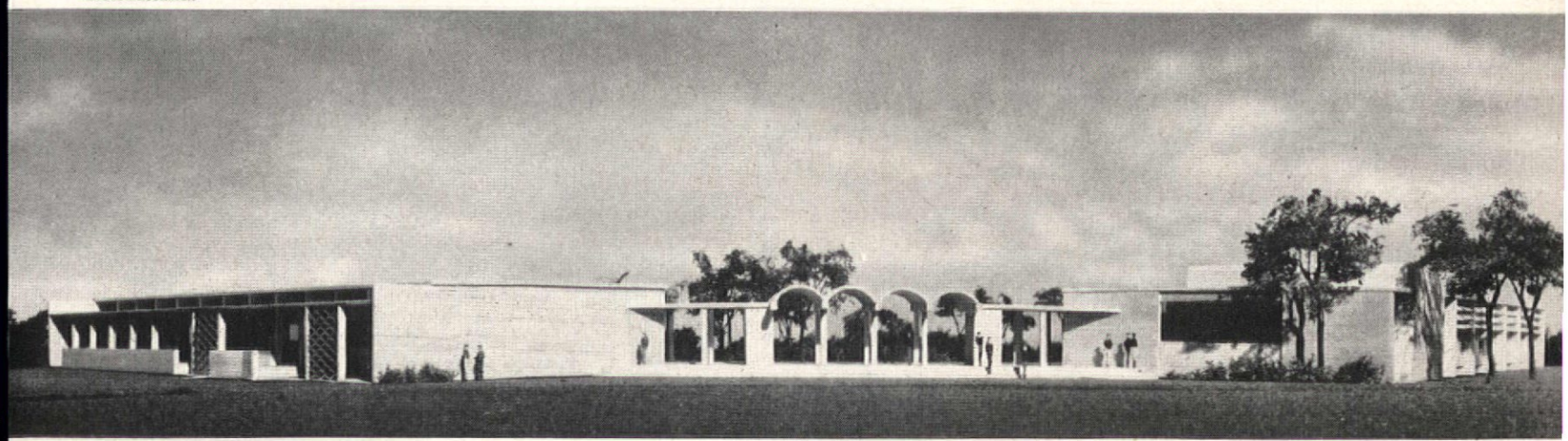
CENTRAL HOSPITAL in Lima has 500 medical and surgical beds and 350-bed maternity wing. Developed with help of USPHS and designed by Edward D. Stone and A. L. Aydelott, associated architects, the $12 million project will be operated by Peruvian government for 75,000 Lima white-collar workers under social security program.



NEMAZEE MEDICAL CENTER in Shiraz was built by Iranian philanthropist. Edmund J. Whiting, architect; Severud-Elstad-Krueger and Ernest Franck, engineers. Among other hospitals overseas, Whiting also designed Roosevelt Hospital, Guatemala, Methodist mission hospital in Southern Rhodesia.

AGRICULTURAL INSTITUTE at Allahabad, India (below) is the work of Architects Mayer & Whittlesey. The campus, almost completed, includes administration building (left) and library (right); concrete arches lead to school buildings, chapel, dormitories. The Institute will be more fully published in a future issue of FORUM.

Louis Checkman



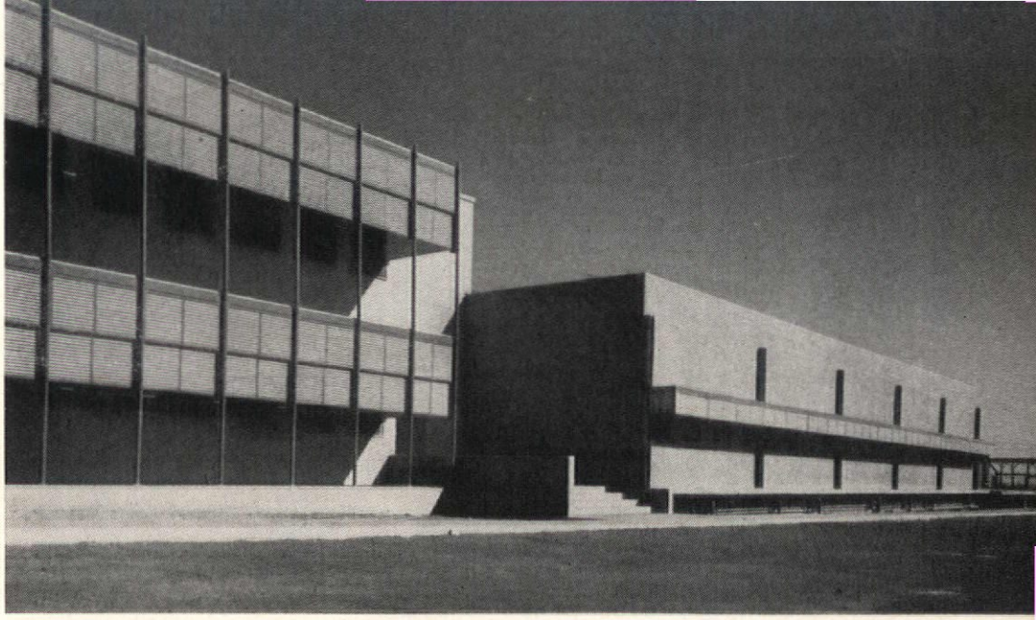
INDUSTRY: NEW INVESTMENTS

Almost before the ubiquitous Coca-Cola first went abroad (in 1909), US planners, architects, engineers and builders have been hard on the heels of industrialist-explorers all over the world. The contract-engineering firm of Frederick Snare, for example, has in the past 50 years completed close to 850 jobs in Latin America and elsewhere. Bechtel Corp. has built pipe lines and refineries for a handful of oil companies in the Middle East (photo below). We have been designing and building for foreign interests too: Bechtel recently finished a $100 million refinery and town at Aden for British Petroleum Company, Ltd.; Stone & Webster engineered a new refinery near Milan for Italian investors; Ralph M. Parsons Co. is completing a refinery for the Turkish government and Morrison-Knudsen is working on a gas pipe line to Karachi.

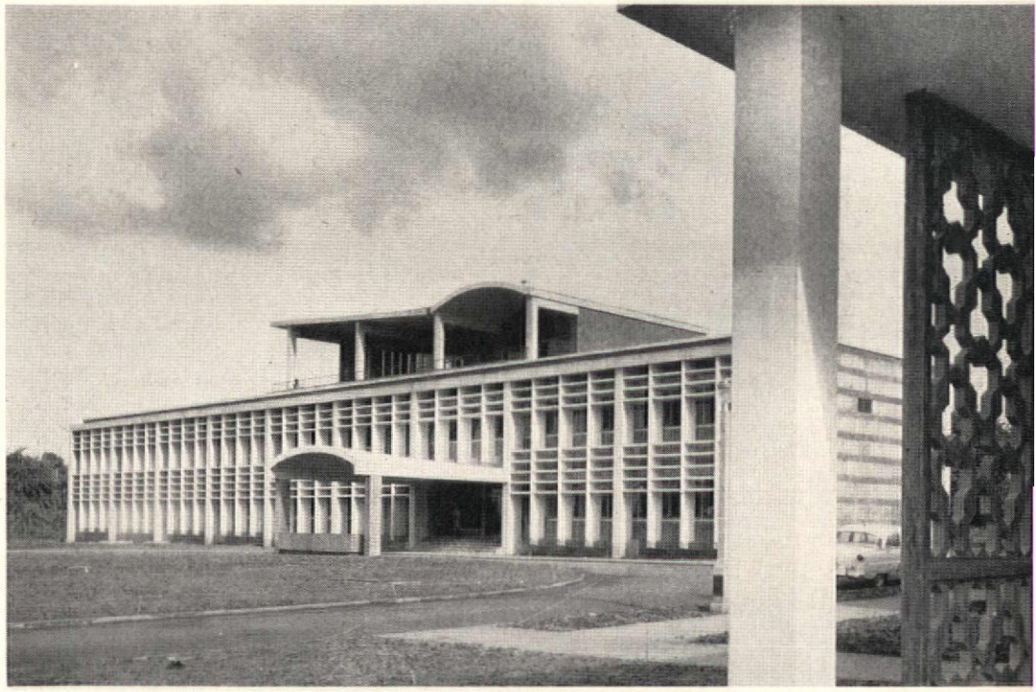
As they invested billions of dollars in new sources of raw materials, big US extractive industries of oil and steel became even bigger clients overseas than they are at home, for planners and architects as well as engineers and builders. They also illustrated the great swing in capitalism, away from the old idea of simple "exploitation" toward the new idea that he who creates unprecedented prosperity among new groups of people creates thereby new *markets* for his product. To get better workers meant building a great deal besides production facilities, administration facilities, executive housing: it meant housing or housing loans and floor plans for thousands of native workers, schools and outside scholarships to train employees and their children, and the community centers, hospitals, churches, stores, recreation centers for new towns often in wilderness.

The bigger the industry and the more primitive the country, the more welfare and building become one, and the more must be done that is not directly connected with the company, to steer clear of the "imperialist" label, restrictive legislation or outright nationalization. As one US corporation president put it: "We are trying to show them that we are really putting back into the country more than we are taking out."

TRANS-ARABIAN PIPE LINE, built by Bechtel, carries oil to Mediterranean



RESEARCH AND DEVELOPMENT LABORATORIES on Bahrain Island, Persian Gulf, were designed for Bahrain Petroleum Co., Ltd. by Architect Chauncey Riley of New York. Long hood over windows of laboratory building at right keeps bright sunlight from penetrating interior and affecting products under test. On office building at left, lower halves of freestanding blinds slide up to allow more sunlight during winter. Buildings are part of refinery development started in 1936 by Bahrain Petroleum (wholly owned by California-Texas Oil Co.). Riley also designed housing, hospital addition, dining halls, theater, library, gymnasium, shopping center and small hotel in nearby company town of Awali. Last month Caltex opened the Philippine Islands' first refinery at Batangas Bay with housing, hospital recreation and school facilities by Riley. It also has communities in Rumbai and Perawang, Indonesia, an office building, cafeteria, housing and refinery in Holland.

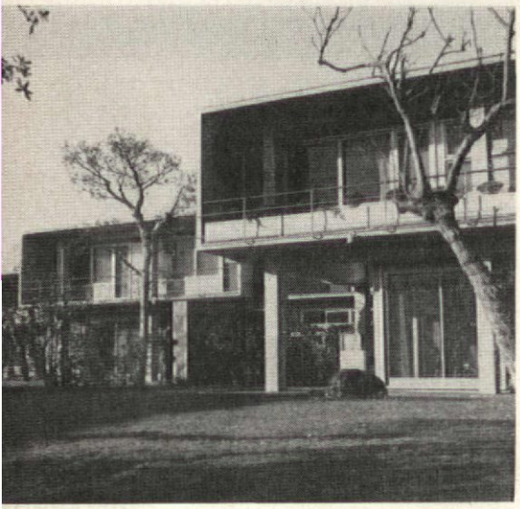


ADMINISTRATION BUILDING is part of Standard Vacuum Oil Co.'s new Bombay refinery project, laid out by US Architects Mayer & Whittlesey and local associate Durga Bajpai, built by local contractors. Building has sunshade fins to reduce cooling load, private dining room and terrace on roof. In right foreground is patio for employee cafeteria and recreation building. (Housing for refinery workers is shown on p. 108.)

BOMBAY OFFICE BUILDING of Standard Vacuum Oil has fixed sun-louvers of precast concrete (important on northwest and southwest sides shown here) which cut air-conditioning loads, are less expensive than operating louvers and need not be adjusted by busy employees. Louvers and main entrance were designed by Chauncey Riley, building itself by local Architect John A. Ritchie. Arresting honeycomb exterior is floodlighted at night.

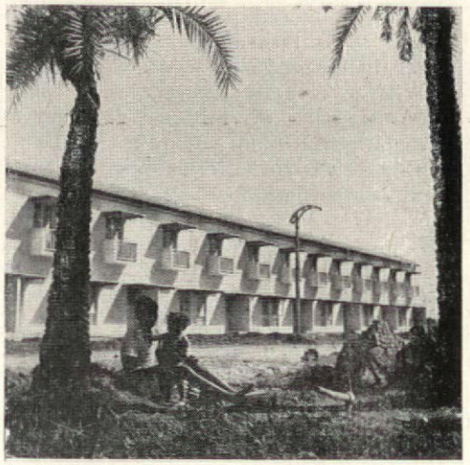
Courtesy Creole Petroleum Corp.

ELEMENTARY SCHOOL (left), town plan and houses were designed by Skidmore, Owings & Merrill for expanding refinery town built by Creole Petroleum Co., Jersey Standard's big Venezuelan affiliate. Creole pays tuition for workers' children but, following new policy of integration, is turning over all community facilities it builds to nationals to run. Company shares costs with government, offers house plans, loans to residents.

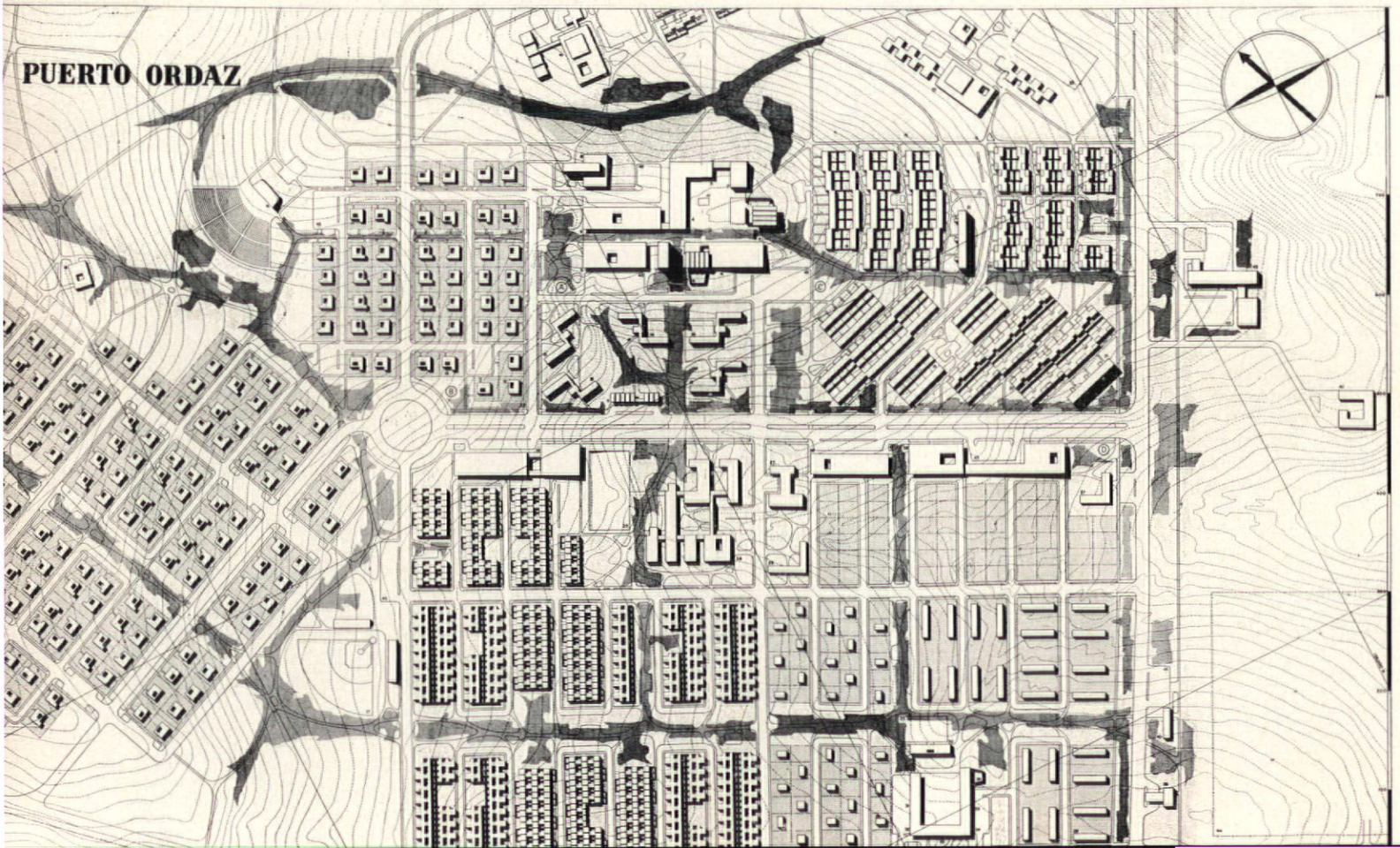


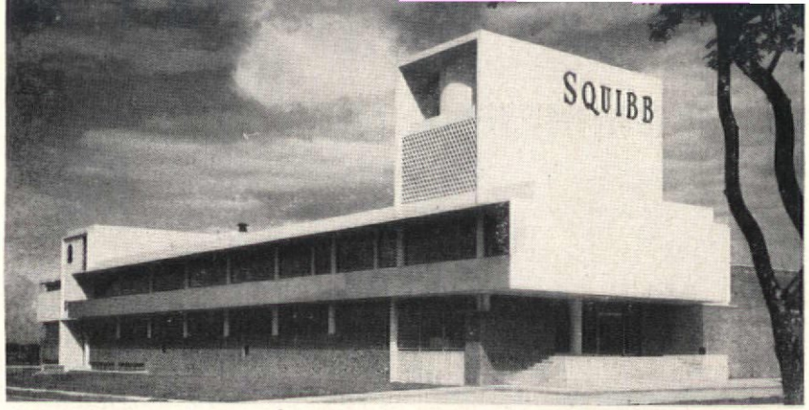
SENIOR STAFF HOUSES in Tokyo (left) and Homoku, Japan, were built by Standard Vacuum Oil Co. for American employees. Architects: Antonin Raymond & L. L. Rado.

WORKERS' HOUSING (right) for Stanvac's big Bombay refinery was designed and built by local architects and builders on Mayer & Whittlesey's community plan, which includes staff and employee housing units, recreation center, cafeteria.



NEW PORT CITY for 40,000, *Puerto Ordaz,* and its companion, *Ciudad Piar,* new mining town in Venezuelan mountains, has cost the Orinoco Mining Co. (US Steel) $30 million so far. Architect-Planners Wiener & Sert, and Oficina de Planificacion y Vivienda, started wholly afresh, with civic center (separating the shopping center and public square, including church). Workers live in four zones: *obreros* in cement-block row houses reversing most US planning conditions—almost no cars, few roads, little parking but many pedestrian paths, close-by recreation; *junior staff; senior staff* (progressively more space, cars); finally an inevitable *service population*—not employed by Orinoco but responsibility assumed and precautions built in to prevent their creating typical fringe slums. (These are integrated towns and expansion is planned for.)

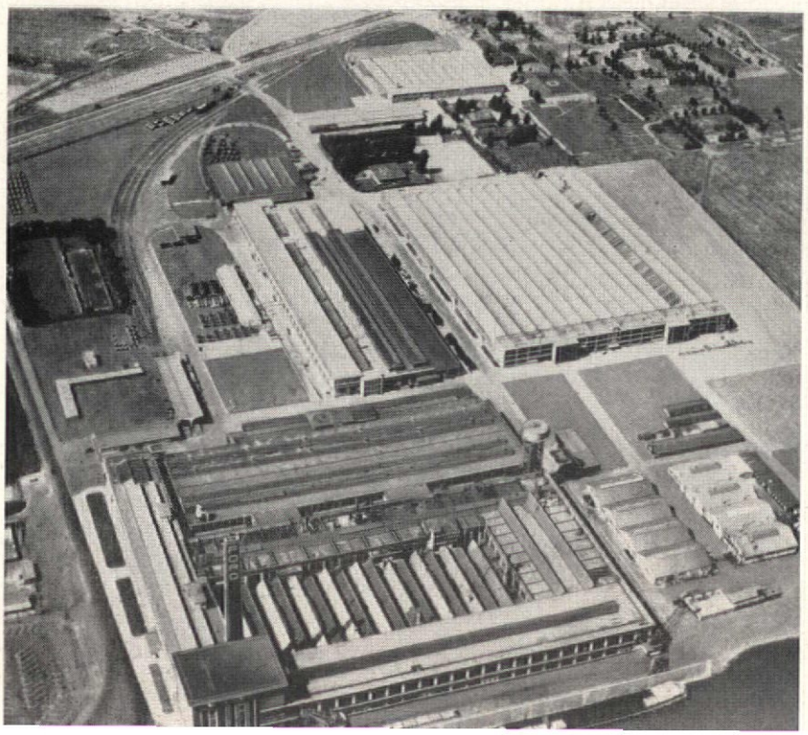




PHARMACEUTICAL COMPANIES are all over Latin America, expanding into Near and Far East as well. Last year Squibb completed a $1 million air-conditioned plant at Cali Colombia (left) by local architects, has also built in Argentina, Brazil, Cuba and Peru, Turkey and the Philippines. Abbott Laboratories, with operations in 38 countries, will open a new Caracas plant this spring. Sterling Drug has opened new factories in Brazil, Colombia and South Africa (architects: Barnum & Thompson). Pfizer, Lilly and Lederle are also active abroad.

RADIO CORP. OF AMERICA has built or added to plants in Argentina, Brazil, England, Greece, Italy. At left is the new Madrid factory of Inelsa, RCA associate in Spain. Left of tower is recording studio.

GENERAL MOTORS' new assembly plant at Antwerp was designed by Smith, Hinchman & Grylls in collaboration with Belgian Architects V. Cols, J. De Roeck & Associés. Behind glass showroom at left are offices, parts and new car warehouses. At right are assembly buildings, power plant. GM is spending $191 million to expand facilities in seven European countries, has built other new plants in Karachi and Montevideo.

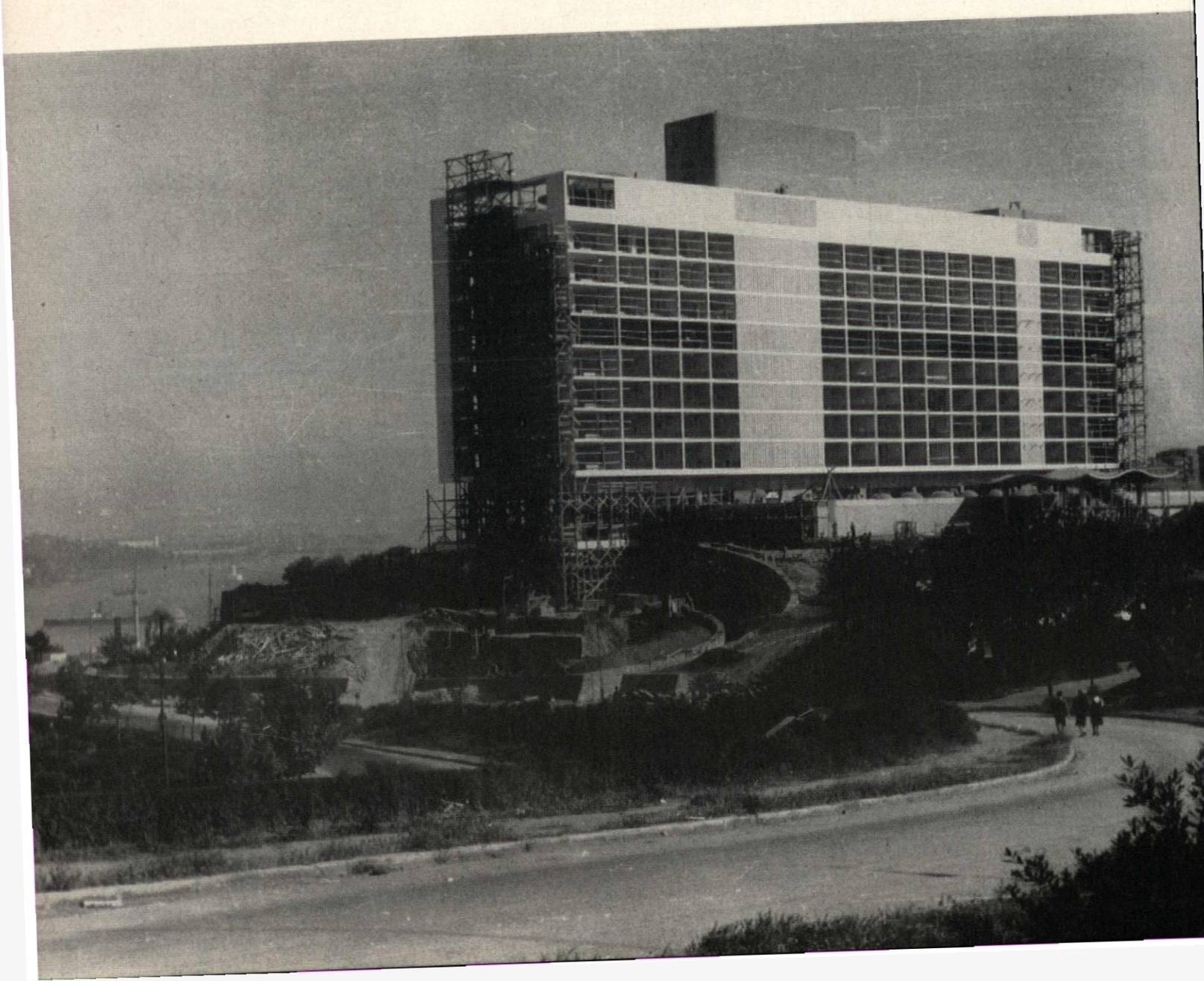


FORD MOTOR CO. plant at Cologne, by German architects, engineers and builders, turns out 40,400 cars and trucks a year. Ford has other manufacturing facilities in England and France, new assembly plants in Alexandria, Egypt (1950) and Sao Paulo, Brazil (1953). Chrysler is building new offices in Mexico City. Local affiliates of Studebaker-Packard have opened plants and showrooms in Latin America, Africa and Europe. Kaiser-Willys has built an Israel plant, is looking into South America.

HABANA HILTON, designed by Welton Becket & Associates of Los Angeles, is scheduled for completion in 1956. Financed by Cuban pension union, the $13 million project will have 630 air-conditioned rooms and 42 de luxe suites, ground and rooftop swimming pools, 450-car garage, mosaic exterior.

COMMERCE: NEW MARKETS

With an eye on newly developing markets, US hotelmen, retailers, bankers and manufacturers are setting up shop overseas in bigger numbers than ever. Hilton, with 28 hotels in the US and Puerto Rico, one in Spain, is under way on five more abroad. Intercontinental Hotels and Sears, Roebuck are adding to their South American chains. Foreign investors are calling on US architects for office buildings, shops and showrooms. And in trade promotion, a new Commerce Dept. program is already helping US businessmen show off the nation's industrial achievements at international trade fairs, a field in which most other governments have long helped their manufacturers compete (and in which communist countries have stolen more than one propaganda march on the US with lavish, state-sponsored exhibits).

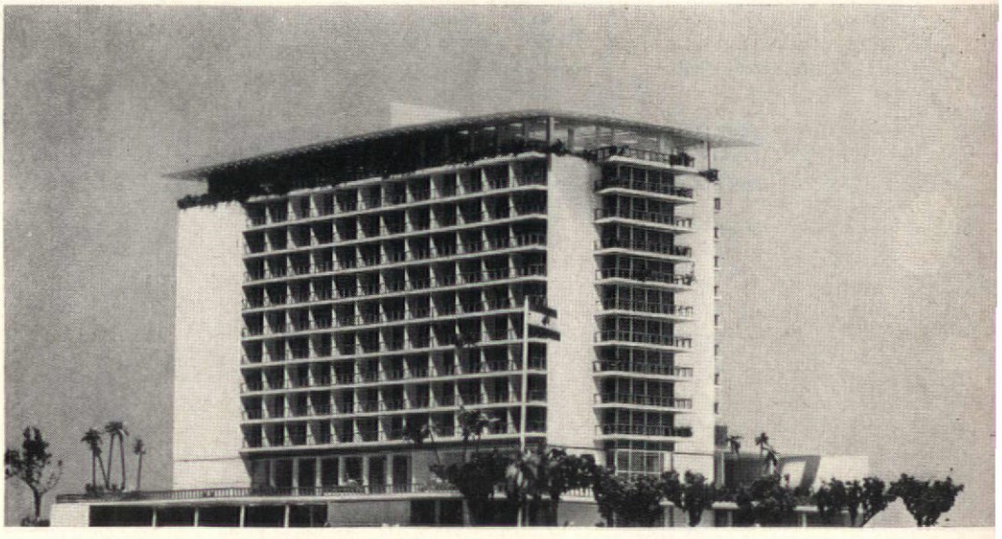


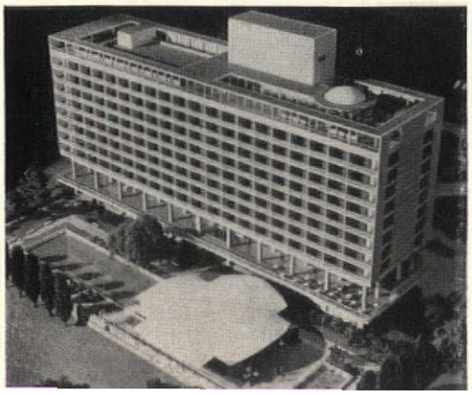
INTERCONTINENTAL HOTELS CORP., set up in 1946 as wholly owned subsidiary of Pan American World Airways, has taken over management of five South American hotels (of which it has remodeled three) and has built four new ones. Largest new hotels are the $7.5 million Tamanaco in Caracas (left) and the $8.7 million Tequendama in Bogota (below), both with 400 rooms and designed by Holabird & Root & Burgee. IHC is building a 120-room hotel in Curaçao and plans another of 100 rooms for San Salvador, both designed by IHC Architect Joseph Salerno and Engineer R. S. Smith.

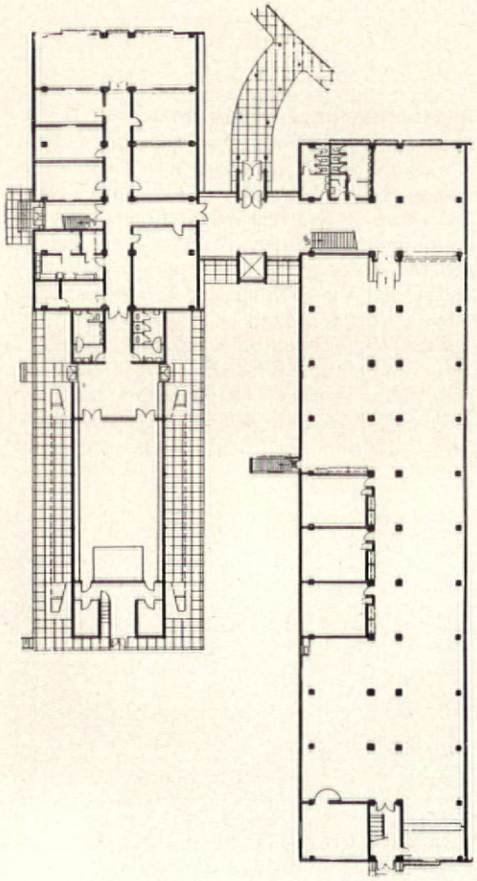
ISTANBUL HILTON (above, below and left) was designed by Skidmore, Owings & Merrill, will open its 300 rooms to Middle East travelers this May. Turkish Pension Fund financed construction at $20,000 per room; Hilton provides working capital, pays two thirds of operating profits as rent. Hilton is also building new hotels in Mexico City and Acapulco, both designed by local Architect Fernando Parra, will soon start work on $7 million, 400-room luxury hotel in Rome, and in Cairo, will open Nile Hilton by Welton Becket.

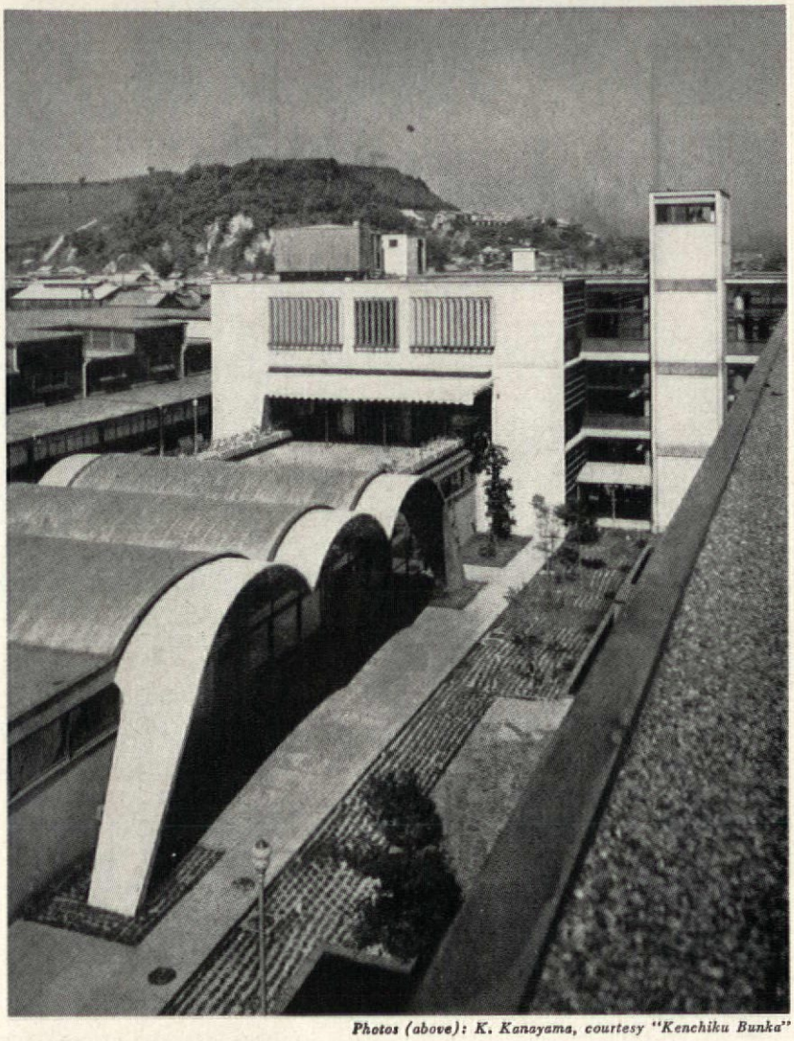
SAVOY PLAZA HOTEL in Beirut, now in foundations, was designed for Lebanese investors by Edward Stone of New York and Elias & Dagher of Beirut. It will cost $4 million, have 221 rooms, pantry on every floor, roof grill and swimming pool.

Wyn Moroz





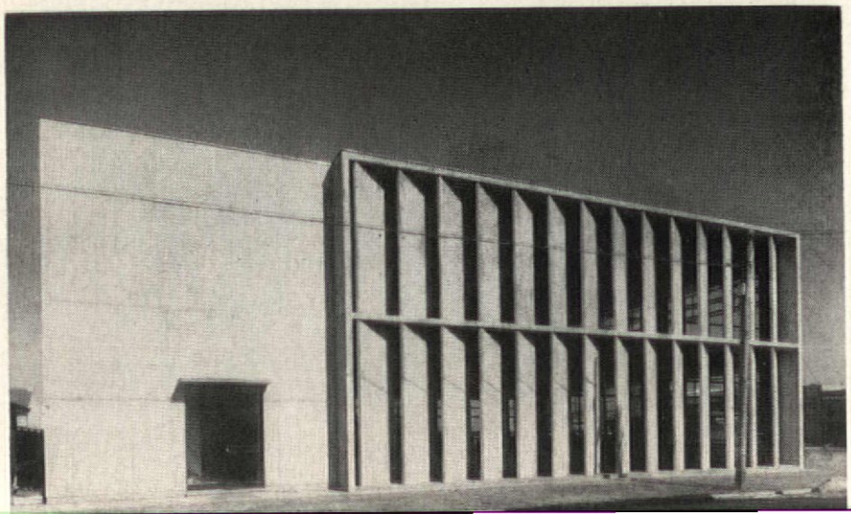




OFFICE BUILDING in Yawata, Japan, was designed for the Yasukawa Electric Manufacturing Co. by Antonin Raymond and L. L. Rado. Long center court with pool is flanked by offices (top), auditorium of shell cncrete arches (right). South- and west-facing windows are shielded by sun louvers. Tall element at right is elevator shaft.

Photos (above): K. Kanayama, courtesy "Kenchiku Bunka"

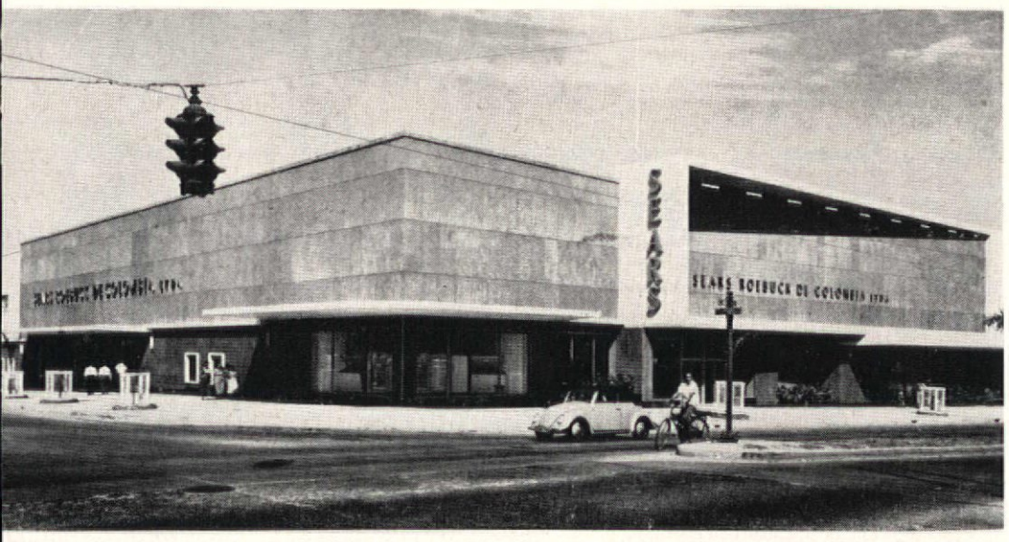
BANK BUILDING in Nagoya, Japan, was designed for National City Bank of New York by Raymond & Rado. National City, which started its expansion into Latin America in 1914, now has a dozen Asian branches among its 57 overseas offices.



FIRST SHOPPING CENTER in booming suburban Caracas opened last November with American-style supermarket, eight smaller shops, offices. It is second such project promoted by VBEC (Venezuelan Basic Economy Corp.), set up by Nelson Rockefeller and his brothers to join with local capital in developing agriculture and industries vital to economic advancement. The center was designed by Oficina Don Hatch, Caracas.

Rhys-Doreyne

KNOLL ASSOCIATES of New York have opened seven overseas showrooms for furniture and fabrics, including one in Paris (above).



SEARS, ROEBUCK has built or acquired 26 stores in Latin America, will open three more this fall (in Lima, Mexico City, Sao Paulo). Plans are prepared by Sears' Architects John Redden and John Raben with local architects. Left: new store in Barranquilla, Colombia.

AUTOMOBILE SHOWROOM for Studebaker-Packard and Morris cars was designed for Caracas dealer by New York's Roger Halle.

RENTAL OFFICE BUILDING designed by Lathrop Douglass for US and local tenants will be largest in Caracas, have ten office floors, penthouse restaurant, shopping plaza, basement parking for 200 cars. Construction on the $3 million project will start next month.

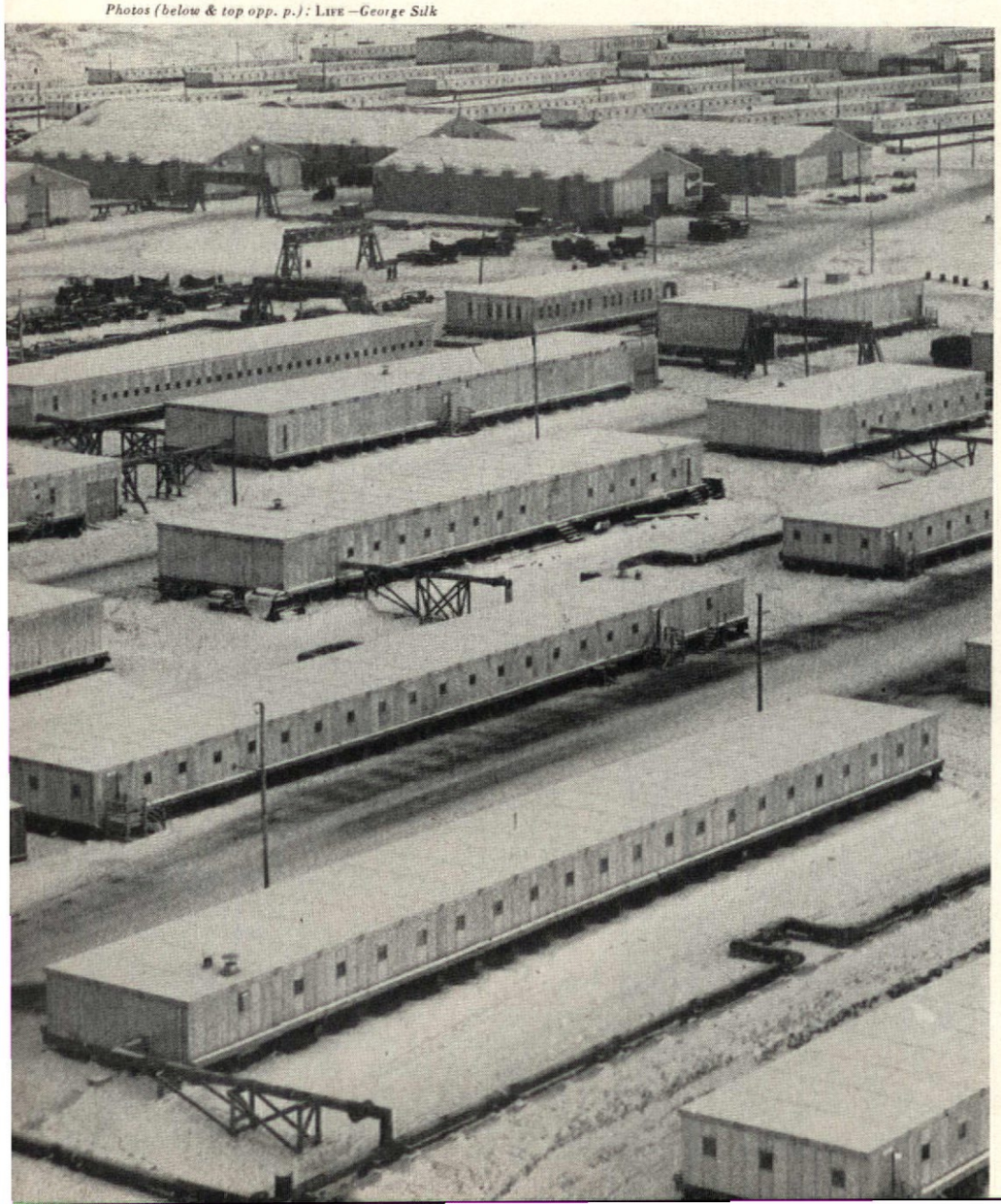
DEFENSE: NEW STRATEGY

Building a defense perimeter overseas has posed a wide range of problems for service engineers and their civilian partners. Contract architects, engineers and builders have had to adapt the necessary installations first to jungle heat and then to the icy winds of the Arctic barrens.

Bulk of the work abroad during the past three years has been for the Army Corps of Engineers, and the bulk of their work, in turn, has been for the Air Force: a band of bases across the top of the world (Alaska, Canada, Labrador, Greenland, Iceland) and another band across the middle (Bermuda, the Azores, French Morocco, Tripoli and the Middle East). The Navy's Bureau of Yards and Docks has had work of its own in the Carribbean and Pacific, work for the Air Force in Guam and recently in Spain. Here four airfields and two ports are being carried out by Architect-Engineers Frederic R. Harris, Metcalf & Eddy, Shaw, Metz & Dolio, Pereira & Luckman. Management contractors: Raymond Concrete Pile Co., Walsh Construction, Brown & Root.

ACCENT ON THE ARCTIC for advance bases has meant working with totally new conditions: temperatures ranging from 60° F. to —50°, normal winds of 35 mph with gusts up to 125, permanently frozen earth and fossil ice down to 1,000′ or more. To avoid disturbing the active surface layer, which would result in settling and cracking foundations, B-36 hangars at the giant Thule base (right) have 4″ of foamed glass insulation in their floor slabs, rest on huge gravel pads 9′ thick laced with forced-air ducts to dispel heat transferred down during winter. Thule architect-engineers for Corps of Engineers were Metcalf & Eddy and Alfred Hopkins & Associates.

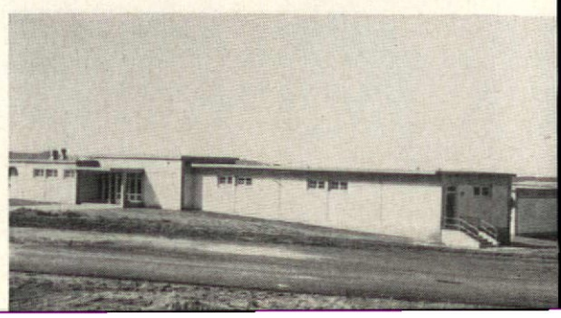
Photos (below & top opp. p.): LIFE —George Silk

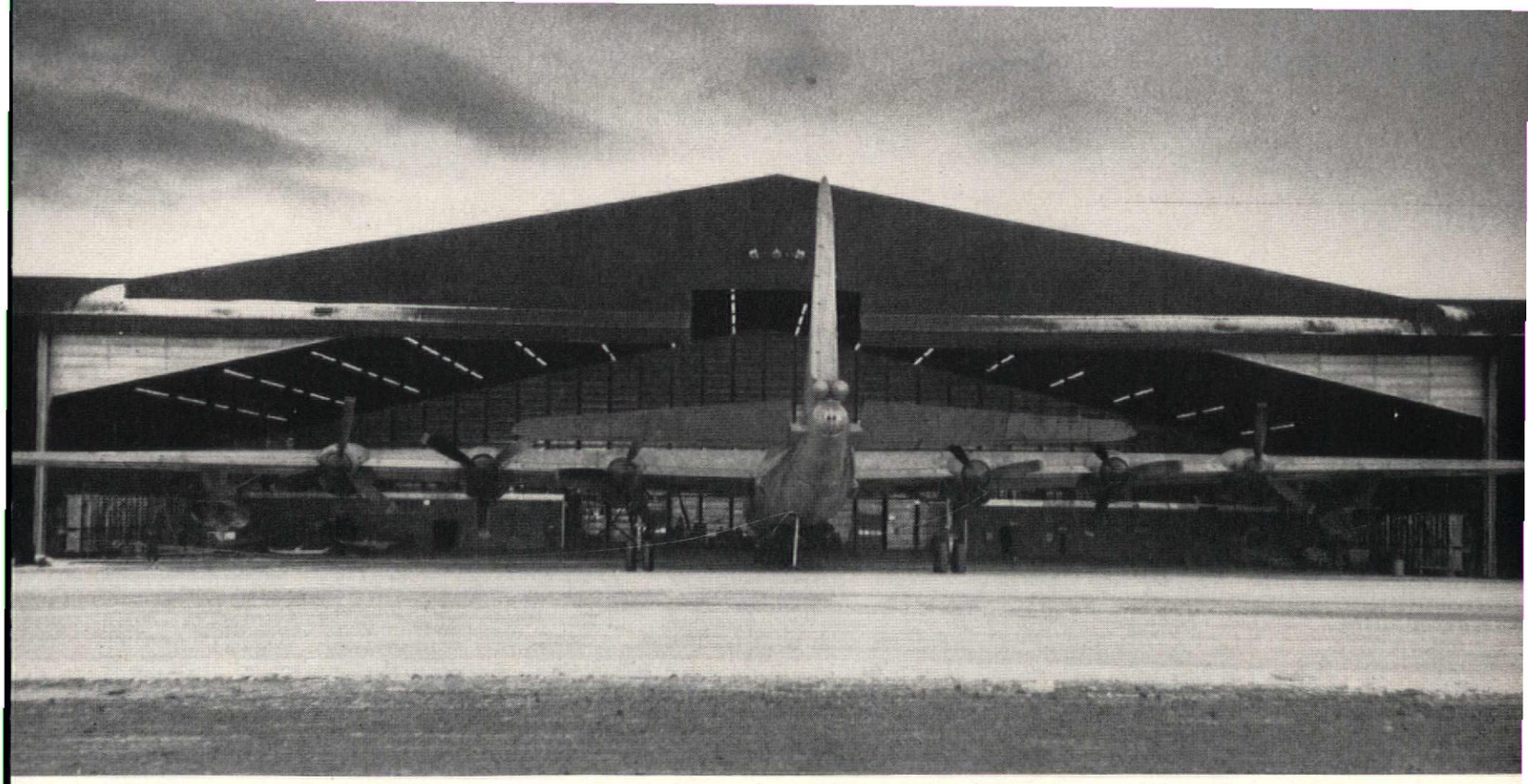


PRECAST WAREHOUSE at Iceland base is of concrete frame and panels, shipped from prefabricator in Holland. Same prefabricator did Air Force buildings in Greenland.

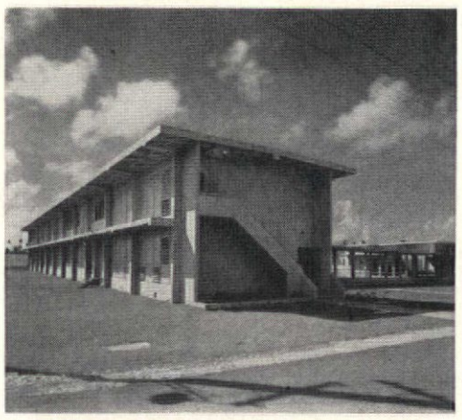
"ICEBOX" BARRACKS at Thule are built of insulated prefab panels (glass-fiber sandwich of aluminum-clad plywood). To prevent heat transfer, buildings are raised 2′-9″ on wood posts set on 3′ gravel pads.

SCHOOL for military and civilian children at Port Lyautey, French Morocco, is of concrete frame and block. Architect was James C. Mackenzie.

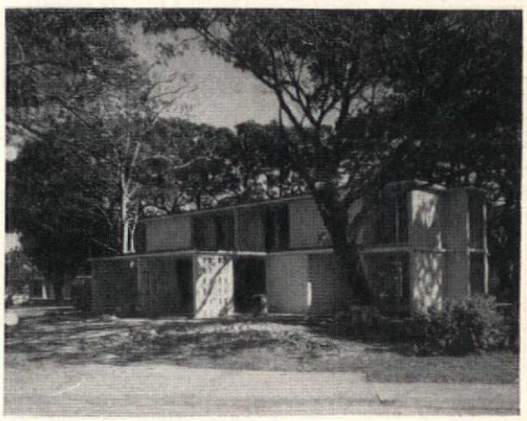




SUBMERGING BARRACKS north of Thule were developed by Army engineers and Metcalf & Eddy. Towers are extended as metal pressure hull sinks slowly into deep snow.



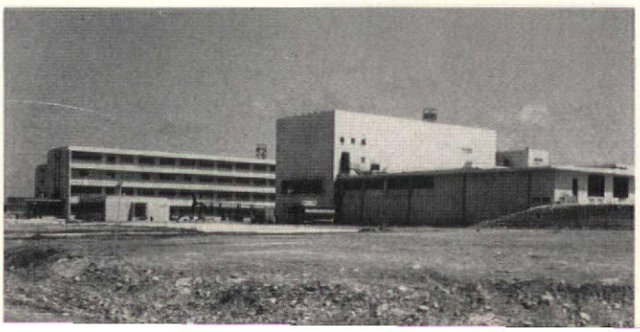
CONCRETE NAVY BARRACKS at Guam were built of precast slabs with shutter walls by Pacific Island engineers (F. R. Harris, Inc., Blanchard & Maher, Keller & Gannon).

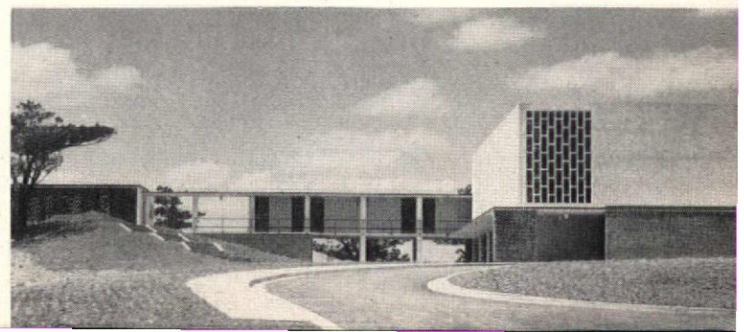


HOT-WEATHER DESIGN for Navy families at Guantanamo Bay, Cuba, has floor-to-ceiling jalousies, block walls. Architects: Fisk, Johnson & Perkins; Ossipoff & Preis.

HOSPITAL at Naval Air Station, Guam, was designed by Pacific Island engineers. Built of reinforced concrete, it is planned for expansion from 350 to 500 beds.

CHAPEL BUILDING is part of permanent Army town at Sukiran, Okinawa, designed by Architects Skidmore, Owings & Merrill for Army engineers.

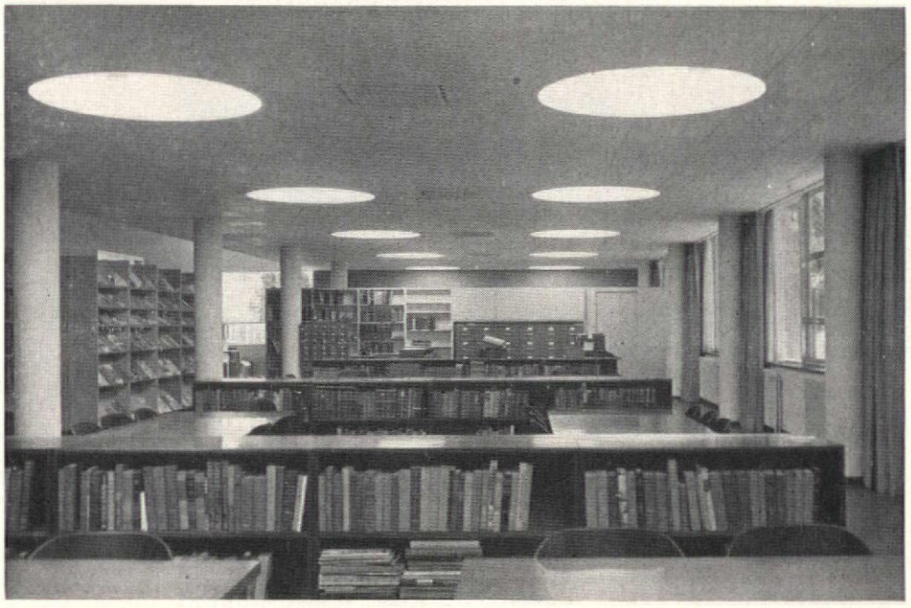




DIPLOMACY: NEW PUBLIC RELATIONS

On the preceding 14 pages has been shown some of the great spread of planning and building by which we are furthering our ends and the ends of others all over the world —and by which other peoples are judging our motives and our abilities in all fields. The free nations have come to accept US partnership in world economics and world politics, and we are coming to accept the responsibilities that go with it. Yet some, especially in the older nations, still like to look upon Americans as a bunch of cultural cowboys. Here then, in conclusion, are some of the newest buildings that represent us officially in our economic and political roles, and in our cultural role as well. They bear the American flag, so they must represent us well. We believe they do.

COPENHAGEN EMBASSY (left and above) is set back among trees lining the Osterbrogade, one of the main arteries leading from the city to the northern suburbs. Auditorium and skylighted reading room (right) are readily accessible to public; the embassy offices are raised on columns, for security control as much as architectural effect. Both Copenhagen and Stockholm embassy (see overleaf) were designed by US Architects Ralph Rapson and John van der Meulen in the offices of Anders Tengbom, Swedish consulting architect, under the direction of Ides van der Gracht, US State Dept. regional director for foreign buildings operations.



ELEVEN OTHER EMBASSIES have been completed by FBO since 1945, with 97% of funds coming from debts owed US. Rio de Janeiro and Havana embassies were designed by Harrison & Abramovitz, Ankara by Eggers & Higgins, Saudi Arabia by the Byrne Organization. FBO with foreign architects designed the embassies in Iran, Liberia, Thailand, Brussels, Costa Rica, Australia, Ethiopia, and two more under construction in Spain and Nicaragua.

RIO EMBASSY

BRUSSELS EMBASSY

LIFE—*N. R. Farbman*

MADRID EMBASSY

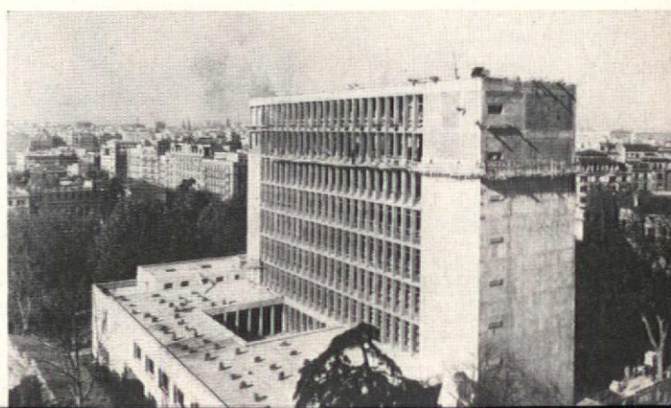
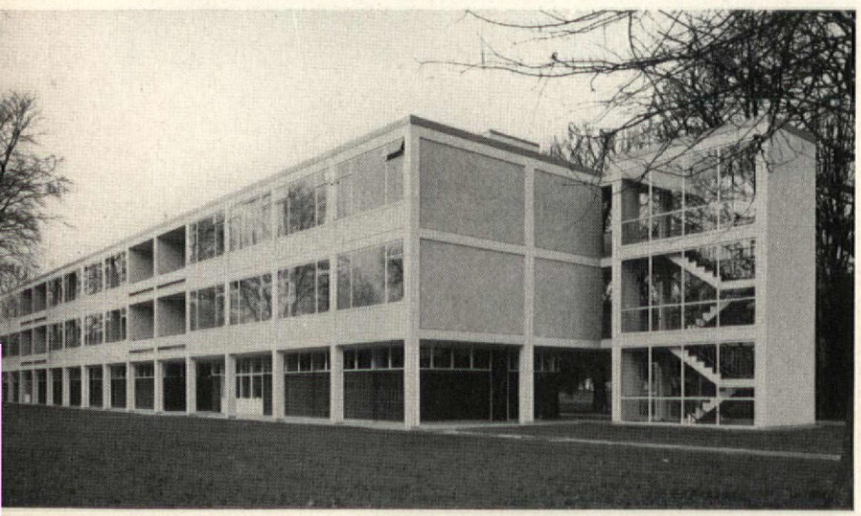


Photo by Peter Blake

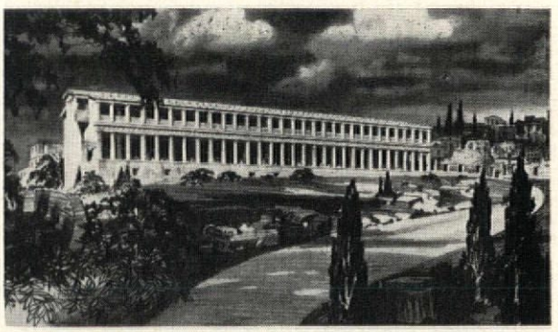
HOUSING at Bad Godesburg for German employees of US government. Designed by Apel, German associate of Skidmore, Owings & Merrill, built under Army Corps of Engineers.

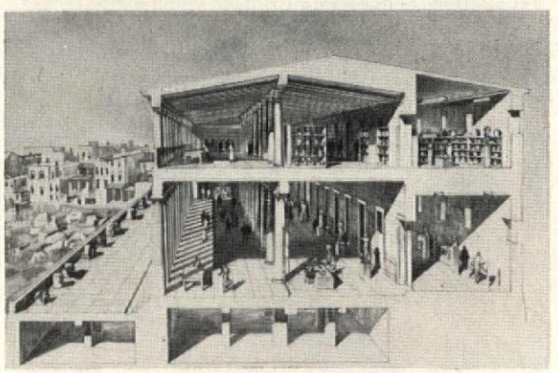
STAFF HOUSING, a relatively small part of FBO's program, has produced good architecture to represent the US, paid off in reduced quarters allowances for foreign service personnel. Aside from a half dozen new homes for ambassadors or consul generals, projects have included staff apartments in Tokyo, designed by Raymond & Rado (AF, March '53) and apartments by Skidmore, Owings & Merrill to go with their new consulate at Bremen (lower left).

FOURTEEN CONSULATES have been finished since the war: Curaçao, Belgium, Newfoundland, Italy (Naples), Germany (Bremen and Frankfort), France (Strasbourg and Cherbourg), Aden, Saudi Arabia, Brazil (Natal and Belem), Canada (Quebec and Toronto). Under construction: Port-au-Spain, Trinidad; Le Havre, France (by Rapson and van der Meulen), Dusseldorf and Stuttgart, Germany (by Skidmore, Owings & Merrill).

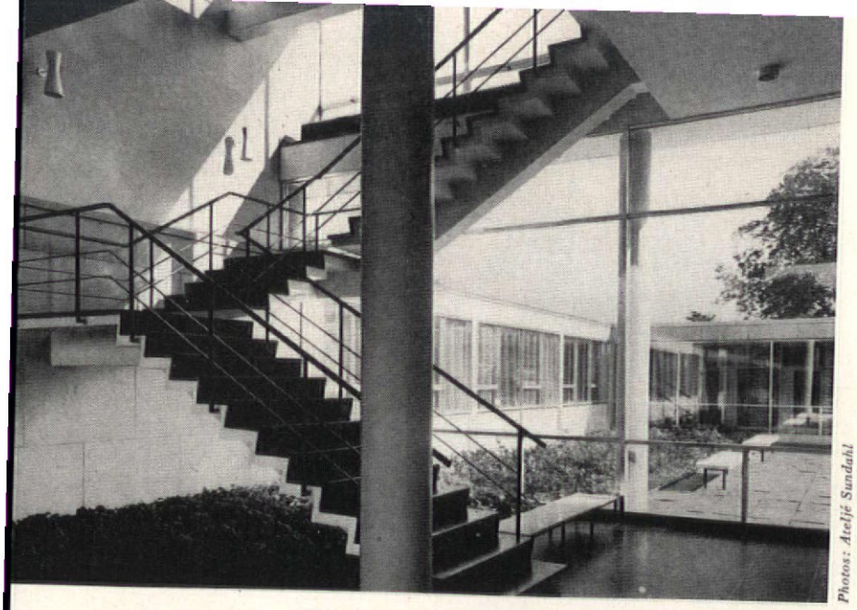


AT BREMEN, staff apartments (above) and consulate (right) by Skidmore, Owings & Merrill.



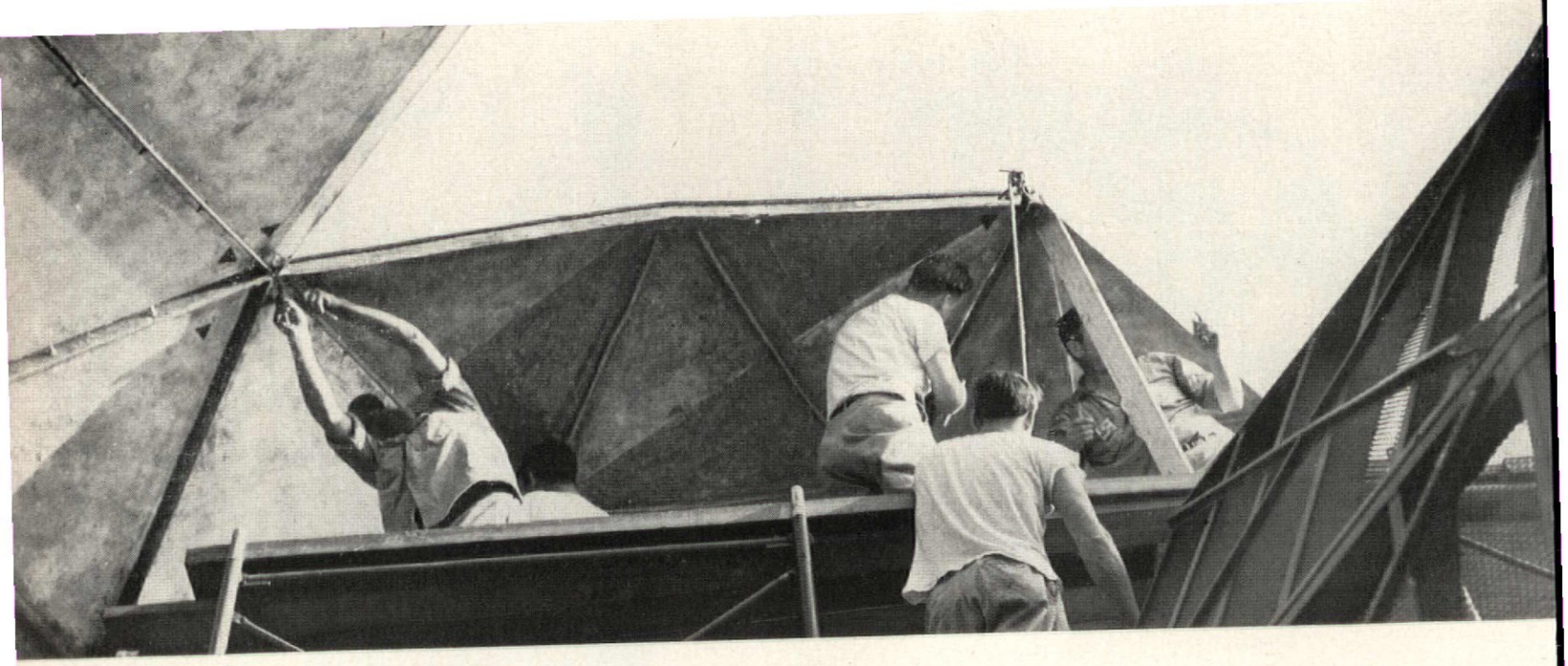


PRIVATE DIPLOMACY: the Stoa of Attalos, shopping, cultural and social center of ancient Athens, is now being restored as an archaeological museum by the American School of Classical Studies, with $2 million donated by Rockefeller and other US friends of Greece. Once the meeting place of poets, philosophers and politicians, it will (by 1957) house relics excavated by US scholars under Homer Thompson and John Travlos. Architects: W. Stuart Thompson and Phelps Barnum.



Photos: Axeljé Sundahl

STOCKHOLM EMBASSY has drawn visits and praise from leading European architects (sample: "the best office building in Northern Europe"). Entrance lobby (above) and gallery (right) open on central garden court. Tall office block (below) faces narrow end to street to keep large building from overpowering other, more residential, embassies nearby. Below this, auditorium-cafeteria faces glass and balcony to southern sun. Architects Rapson and van der Meulen also designed Copenhagen embassy (shown on preceding pages).



PLASTICS IN BUILDING

As production goes up and costs go down, the magic materials move into more and more parts of the building, including the structure—a discussion of assets, liabilities and new uses

Phenomenal growth of the plastics industry during the last ten years has put it ahead of nonferrous metals including aluminum. Up tenfold since 1939 (see chart), annual plastics production is 1.4 million tons, worth $1.4 billion at an average 50¢ per lb. About 200,000 tons of these plastics (14%) go into building construction, the rest go in roughly equal amounts into consumer and into industrial and military items.

Encouraged by skyrocketing sales and confident in their ability to create synthetic materials to withstand almost any ordinary use, the industry's 52 basic manufacturers and 5,000 fabricators believe that the building industry may ultimately offer a greater market for plastics than the current consumer market. On the other hand, US building is conservative and hampered by obsolescent codes and customs and may well prove a very tough market, even for the aggressively young plastics industry.

In spite of severe competition from cheaper and more familiar building materials, plastics have invaded almost every aspect of building construction. Notable examples shown on these pages include reinforced plastic structural members, plastic curtain wall panels, plastic moisture and vapor barriers, foamed plastic insulation boards, fire-retardant plastic roofing films, plastic glazing and lighting fixtures, plastic piping, ducts, conduits and multiuse formwork for reinforced concrete.

How quickly and widely plastics are accepted by the building industry will depend on 1) how much volume production can lower the cost of plastics (see chart)—at the present 50¢ per lb. average they fall in the expensive class; 2) how soon plastics makers can improve such weaknesses in their products, as excessive creep under sustained loading, low fatigue resistance and generally low use temperatures—the plastics industry is already devoting 2½¢ from every sales dollar to research into such problems, nearly $40 million last year; and 3) how manufacturers can develop plastic's three major selling points—lightness, resistance to corrosion and ease of prefabrication.

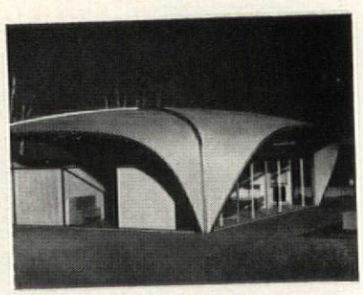
These problems were discussed by 200 chemists and plastic technicians and some 300 architects and building engineers in Washington last October, at a three-day conference sponsored jointly by the Building Research Advisory Board, the Society of the Plastics Industry and the Manufacturing Chemists Assn. The plastics producers gained useful details of the unique problems of construction and of the performance expected from building materials, while the building professionals learned that plastics have matured out of the cocktail stick, toothbrush and breakable-toy era to become respectable construction materials.

The word plastic is a very general term.

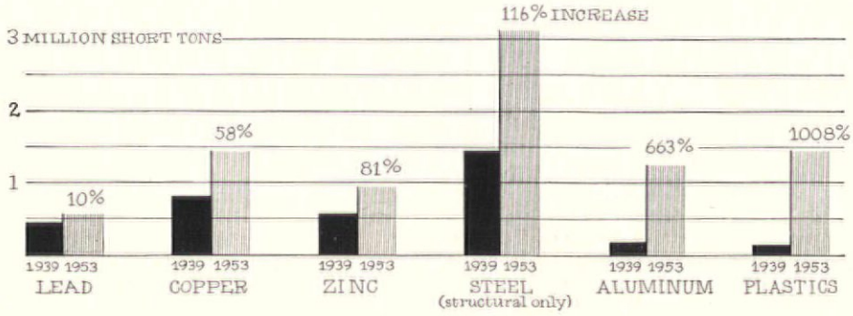
Plastic radar dome built at MIT for USAF experimental station has 33′ diameter. It is composed of interlocking polyester panels connected by wedges at flanges (see top photo). Designers: Geodesics Inc.

Plastic radar telescope designed by Jeffrey Lindsay & Associates would have 300′ diameter with 30′ reinforced polyester struts in geodesic frame. Polyester skin allows it to float in tank for movement.

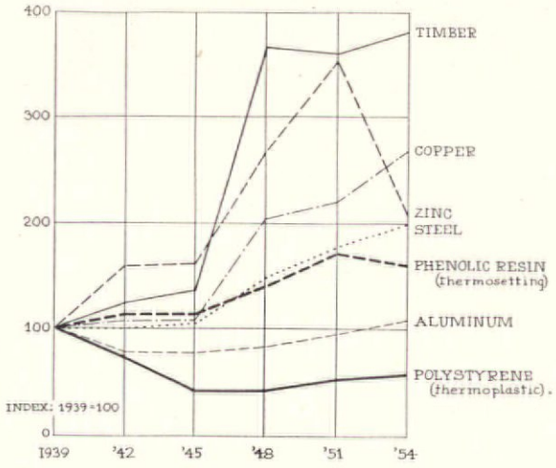
Geodesic restaurant at Woods Hole, Mass., timber framed and covered with 3 mil thick polyester film, successfully withstood last summer's hurricanes. Designers: Architect Gunnar Peterson and R. Buckminster Fuller.



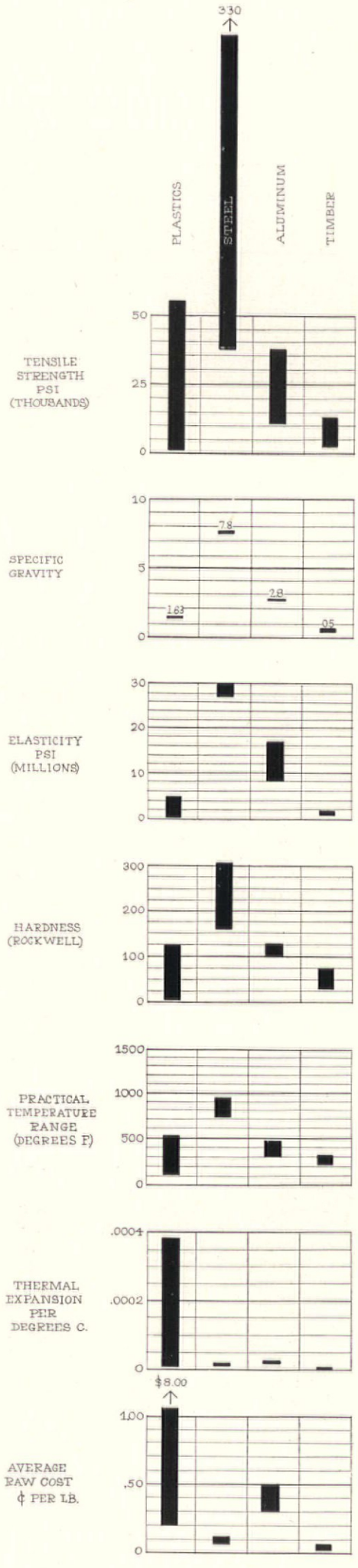
Plastic house proposed by Designer Eliot Noyes for General Electric Co. would be framed by foamed plastic insulation expanded in 2″ gap between two glass-fiber reinforced polyester skins.



Plastics vs. metals: In spite of plastics' extreme lightness, their tonnage production already leads nonferrous metals, is nearly half structural steel. (Total steel products for 1953: 80 million tons.)



Plastics' prices counter postwar trend. On volumetric basis they are cheaper per cubic inch than all the building materials except steel and timber.



It does not define the material any more than does the word metal.

Plastics are organic compounds of carbon with other elements, chiefly hydrogen, oxygen and nitrogen. Some mixtures combine to form thermoplastic materials composed of long, chainlike molecules. Other mixtures combine to form tougher, more heat-resistant thermosetting materials, in which similar long-chained molecules are cross-linked to form large netlike molecules. Such cross-linkage can also be achieved by exposing the plastic to gamma radiation, thus transmuting a thermoplastic into far stronger thermosetting plastic, or to increase the cross-linkage between the molecular bonds of a thermosetting plastic (AF, Sept. '54).

Thermoplastics soften under the application of heat and harden on cooling. The process is reversible and can be repeated indefinitely. Such plastics include the cellulosics, acrylics, vinyls, polyethylenes and polystyrenes. Most thermosetting plastics are prepared in thermoplastic form, molded under suitable temperatures and pressures, and when heated to a temperature between 260° and 350° F., they set permanently, becoming infusible and insoluble. These plastics include the phenolics, aminos, alkyds and most polyesters.

Since thermoplastics soften at comparatively low temperatures, 140° to 200° F., the risk of collapse in case of fire makes them undesirable for use as load-bearing framing members. Certain thermosets, on the other hand, retain their strength up to 590° F., depending on the raw plastic, the reinforcing fillers and the plasticizers used with it. The phenolics, for example, normally soften at 300° F., but the working temperature can be raised to 500° with an asbestos filler, to 600° with glass fibers and to 1,000° with mica splittings.

If plastics are to be of structural value in building, they must compete with steel, and be able to carry a working load for long periods with an adequate safety margin and without excessive deflection. Three factors must be considered: elasticity, cold flow and ductility.

ELASTICITY. While the weight of plastics is only one fifth that of steel, their modulus of elasticity is disproportionately low when compared with tensile strength (only 6 million psi for a good reinforced plastic compared to 30 million psi for mild steel). Thus for a given load a plastic beam would deflect five times as much as a steel beam.

COLD FLOW. Under sustained loading plastics, particularly thermoplastics, tend to flow or creep, the rate of deformation depending on the load, on how quickly this load is applied, on how long it remains and on the temperature of the plastic. Cold flow is reduced by reinforcing. Little research has been completed on the long-term loading of plastics, but experimental evidence shows that an unreinforced thermosetting plastic will lose 75% of its load-carrying capacity in five years. By comparison, aluminum's capacity is not materially affected by time.

DUCTILITY. Nonplastic materials show signs of overloading by cracks at a point of incipient failure, but plastics have such poor ductility that they may fail without warning.

Although plastics appear unlikely to replace steel as a framing material in the foreseeable future, their many advantages—good strength/weight characteristics, ease of fabrication, color, good weathering and corrosion resistance, clean finish and low maintenance costs—make plastics a valuable material for stressed skin space frames, especially domes, barrel arches and vaults.

		BASIC PLASTICS	FAMILIAR USE	PROPERTIES	LIMITATIONS	WEATHER RESISTANCE
THERMOSETS		PHENOLICS, 1909	Telephones, TV cabinets	Hard, rigid, good electrical insulation, good temperature range	Dark colors only	Fair
		AMINOS, 1929 (ureas, melamines)	Lighting fixtures, tableware, stove hardware	All colors, scratch resistant, glossy surface, good electrical insulation. Melamine: good flame resistance	Careful molding required, low impact strength, poor weather resistance.	Fair
		ALKYDS, 1926	Paints, lacquers molded ignition parts	Fast curing, dimensionally stable, good heat and electrical insulation	Low impact strength	Fair to good
		POLYESTERS, 1941 (normally reinforced)	Auto and boat bodies	Weather resistant, tough, all colors, hard surface	High mold shrinkage	Good
		SILICONES, 1943	Auto generators, electric motor insulation	Extremely good heat resistance and electrical insulation	Expensive, no colors, molding difficult, elasticity poor	Very good
		EPOXIES, 1948	Printed circuit boards	Excellent adhesion, good resistance to chemicals and heat	Expensive	Good
		ISOCYANATES, 1953	Wire insulation	Good heat and electrical insulation	Expensive, poor wear resistance	Good
THERMOPLASTICS	NONCRYSTALLINE	CELLULOSICS, 1875	Table tennis balls, tooth brushes, bowling pins, auto steering wheels	Tough, easy fabrication, lustrous finish	Low heat resistance, swells with temperature and humidity changes	Poor to fair
		ACRYLICS, 1931	Observation domes in aircraft, signs, taillights	Optical clarity, outstanding weather resistance, shatter resistant	Soft, easily scratched	Good
		VINYLS, 1927	Floor tiles, phonograph records, auto-seat fabrics	Tough, strong, all colors, excellent electrical insulation	Plasticizers migrate, darkens in sunshine	Fair to good
		POLYSTYRENES, 1937	Venetian blinds, lighting fixtures, refrigerators	Very light, all colors, low water absorption	Low impact resistance, scratches	Poor to fair
	CRYSTALLINE	POLYAMIDES, 1940 (Nylon)	Textiles, gears, slide fasteners	Strong, tough, wide temperature range, wear resistant, self-lubricating	Expensive, requires tight mold	Fair
		POLYETHYLENES, 1943	Squeezable bottles, moistureproof bags	Inert, flexible, tough, wide temperature range	Colors streaky, poor adhesion, waxy finish	Fair to good when pigmented
		HALOCARBONS, 1943 (fluorocarbons)	Chemical piping, gaskets	Tough, highly resistant to corrosion, wide temperature range	Expensive, poor adhesion	Good, very good when pigmented

Proper use of plastics requires a knowledge of their properties and limitations

There are literally hundreds of different plastics, each of which can be modified by scores of plasticizers or fillers. For convenience, they can be classified into 14 main derivative groups, half thermoplastic, half thermosetting, each developed for specific use characteristics (see charts).

Many plastics in each group may have rather similar compositions. Many of about the same composition are made by several manufacturers. The result is confusing—if one wants to use a cast polyester, one is confronted with 14 different trade names—*Atlac, Hetron, Selectron,* etc. Feeling that such a variety of terms may be holding back development, the plastics industry has a committee at work to coordinate them. To date, the most promising recommendation is that manufacturers drop their trade names wherever possible in favor of a simple statement of fact that will be self-explanatory—such as Monsanto polystyrene.

Plastics vary from hard, rigid and brittle materials to those that are soft, distensible and tough. This variety can be exploited. Within reason, the designer can list the characteristics he requires for a particular use, ask the chemist to recommend a material with such characteristics and design around its limitations. In each case there are several common design factors:

▸ Loading. Use adequate safety factors with special attention to deflections and the degree of long-term creep that can be tolerated. Thermosetting plastics are considerably stronger than the thermoplastics, especially if properly reinforced.

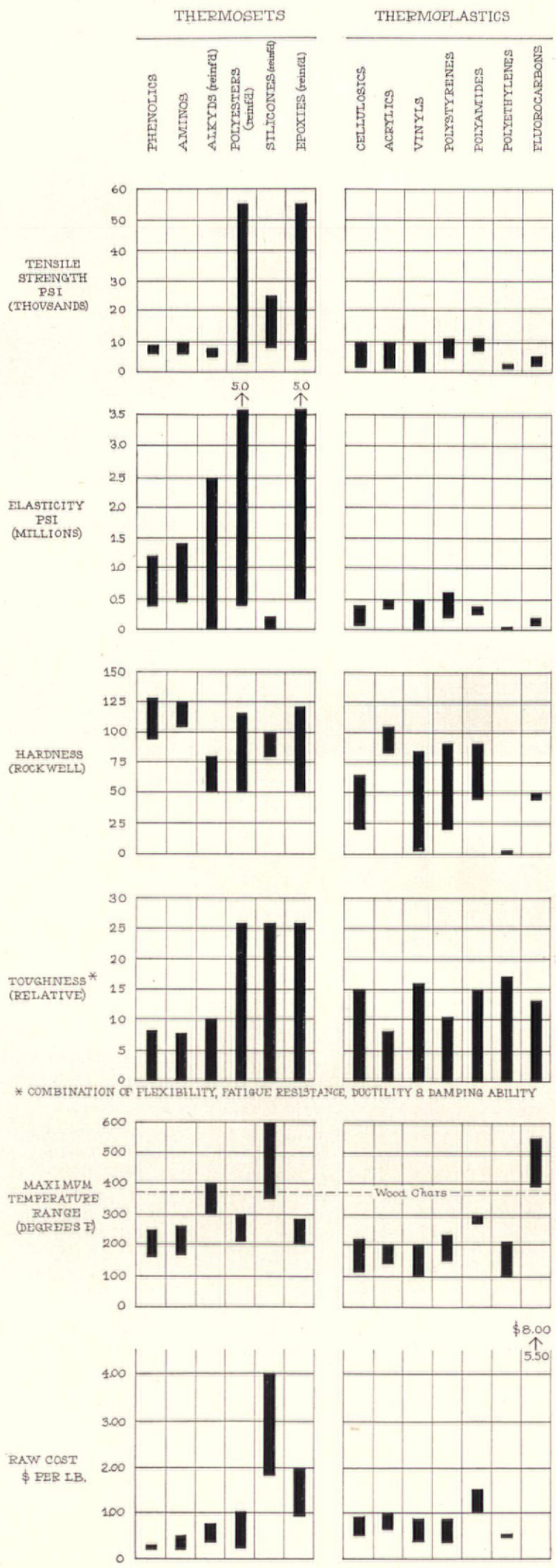
▸ Thermal expansion. The coefficient of expansion of many plastics is exceptionally high, ranging from that of steel for a glass reinforced polyester to about 19 times that of steel for certain phenolics and cellulosics. The coefficient should always be checked when using a plastic with steel or glass, and suitable expansion joints provided.

▸ Maximum use temperature. Temperatures in US buildings may range from extremes of −60° F. to as high as 160° F. Thermosetting plastics are generally satisfactory but most thermoplastics should be used with caution. Plastics are not fireproof, most burn easily once ignited. However, fire retarding additives are available.

▸ Weather resistance. For outdoor use the polyesters and acrylics are best. Materials that absorb moisture should be avoided for swelling and contraction leads to crazing.

▸ Shaping. Plastic products are best designed with rounded edges and with minimum changes in thickness. Sharp edges and V-notches may set up dangerous internal stresses while uneven thickness causes poor curing. Metal inserts require proper anchorage and pinning; any holes in the plastic should be at least seven eighths of the hole's diameter away from edges.

BURNING RATE MAX. USE TEMP.	BUILDING APPLICATIONS
Nil to slow 160 - 245° F.	Wall panels, ducts, hardware, piping, switchboxes, insulation when foamed
Nil to very slow 165 - 260° F.	Wall panels, kickboards, melamine tabletops
Self-extinguishing 300 - 400° F.	Paints, lacquers
Self-extinguishing 300° F.	Curtain wall panels, window frames, glazing, ducts, piping, sprayed coatings, large moldings
Nil 350 - 500° F.	Waterproof coatings, new heat-resistant foamed silicones withstand 700° F.
Slow 200 - 280° F.	Adhesives, laminates, chemical exhaust ducts
Self-extinguishing 140 - 300° F.	Insulation—can be poured as liquid, then expanded; adhesives, waterproof coatings
Slow to high 120 - 220° F.	Cold water piping (in new cellulose butyrate and propionate plastics), glazing, lighting fixtures
Slow to fast 150 - 200° F.	Glazing, top lights, hardware, window frames, lighting fixtures
Self-extinguishing 135 - 200° F.	Floor and wall tiles, kickboards, flashing, expansion joints, glazing, sprayed coatings, wiring, piping, ducts, insulation when foamed
Slow 160 - 215° F.	Glazing, piping, insulation when foamed, wall tile, transparent bricks, lighting fixtures
Self-extinguishing 250° F.	Hardware
Nil to low 200° F.	Wall panels, vapor barriers, wiring, piping, ducts, insulation when foamed
390 - 550° F.	Piping, high temperature insulation



Fabrication techniques

CALENDERING: thermoplastic material is forced between heavy rollers to produce thin sheets or film, or to apply plastics to paper or cloth.

COMPRESSION MOLDING: thermosetting plastic material is poured into a mold and shaped by heat and pressure.

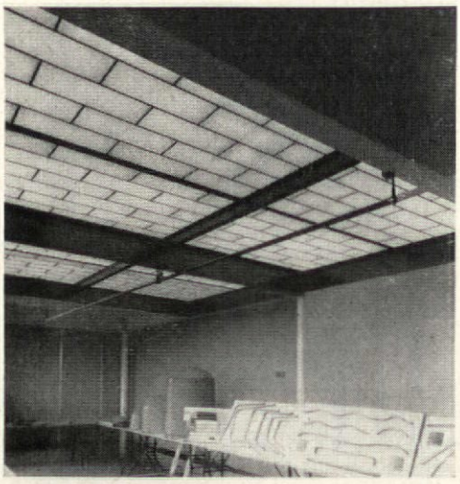
EXTRUSION MOLDING: heated thermoplastic material is forced through a shaped die to form it into continuous strips, rods and tubes.

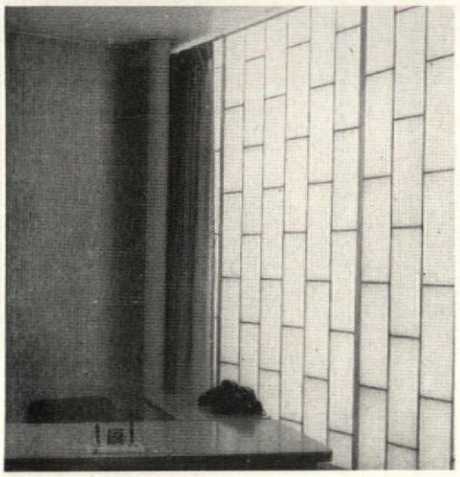
INJECTION MOLDING: heat-softened thermoplastic material is forced into a relatively cool shaping mold.

TRANSFER MOLDING: a similar process for thermosetting materials.

LAMINATING: layers of thermosetting plastic, paper, fabric or other sheeting material are united with plastic adhesives.

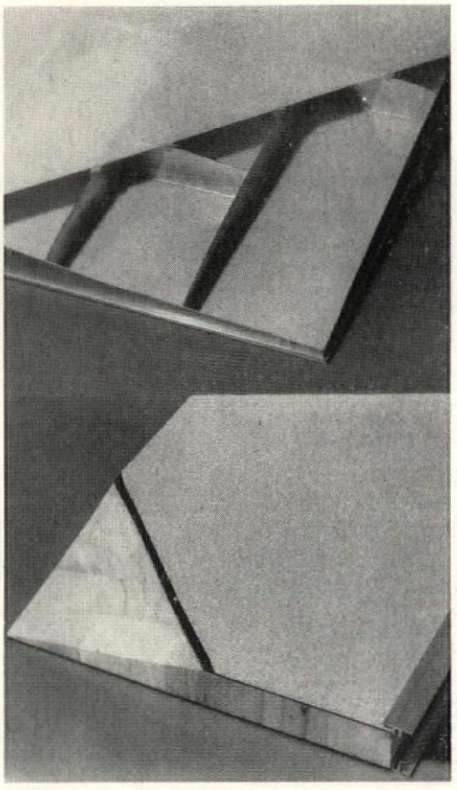
RUBBER BAG MOLDING: high-pressure laminating by inflating or exhausting a rubber bag to apply a uniform pressure.



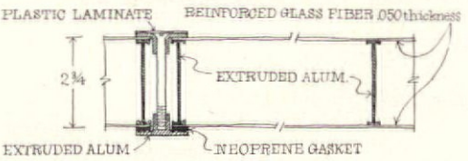


Translucent plastic panels, 4′ x 10′ and 2¾″ thick, are used at skylights (top) and as wall panels in Keller Products Co. building, Manchester, N.H. Designer: Robert Keller.

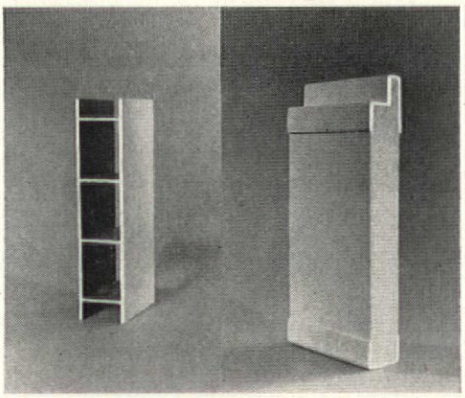
Photos: (top right) Carroll Seghers II; (bot. right) Walter Daran; (others) Eric M. Sanford



Reinforced polyester skins with (top) 2½″ aluminum ribs (U: 0.18; cost: $4 per sq. ft.) and with 2½″ balsa core (U: 0:14; cost: $2.50 per sq. ft.). (Jointing is shown below.)



Single reinforced polyester sheets, 3/32″ thick and set on 2″ x 8″ studs, form 90% of walls of house at Miami, Fla., by Architect Robert Fitch Smith. Translucence of light-yellow panels is controlled by densifying agent during curing.



Other plastic panels: left: phenolic laminates, 1½″ thick with glass-fiber insulation, used in 4′ x 8′ panels in British school by Holoplast Co. Right: foamed styrene core between polyester skins used in 1¾″ panels at University of Michigan building (see text).

Prefabricated curtain walls take advantage of plastics' strength and light weight

Lightweight curtain walls promise to be the plastic industry's biggest contribution to building construction. Plastics' combination of a high strength/weight ratio with good insulating and moisture-resisting values is especially useful in curtain wall panels for framed buildings and in load-bearing structural panels for light frameless structures. In such uses too, their ease of fabrication and lightness may reduce transportation and labor costs enough to outweigh the comparatively high cost of plastic materials. However, because plastic panels cannot pass code fire tests they cannot yet compete with masonry and metal in multistory construction. Here are some pioneering examples of plastic curtain walls:

▸ Keller Products Co. office building at Manchester, N.H. contains 4′ x 10′, 3″-thick translucent plastic panels for walls and a top-lighting roof (photos above). The panels consist of two 0.05″ glass-fiber reinforced polyester skins bonded together by light aluminum transverse ribs spaced 8″ o.c. (As a demonstration building for a plastics maker, the Keller building did not have to meet the usual code requirements.)

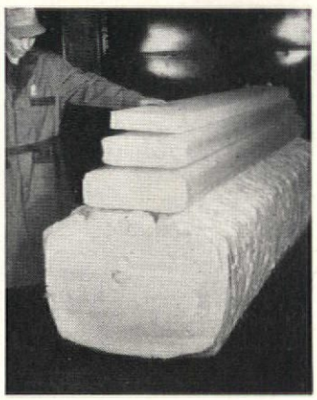
▸ Keller Products also produced the plastic wall panels for the superstructure of a 96′ army towboat. Mounted with neoprene gaskets on a light aluminum frame, these 4′ x 9′-4″ sandwich panels are 1½″ thick with reinforced polyester skins bonded to four types of cores—low-density vermiculite, end grain balsa wood, foamed cellulose acetate and honeycomb paper bonded with phenolic resin. The vermiculite panels weigh 141 lb.

▸ Several country houses near Midland, Mich., by Architect Alden Dow, are built with 4′ x 8′ wall panels of 1½″-thick expanded polystyrene bonded with recorcinol thermosetting resin between two ¼″ plywood skins. The panels are glued to 2″ x 4″ splines by a field-heating process.

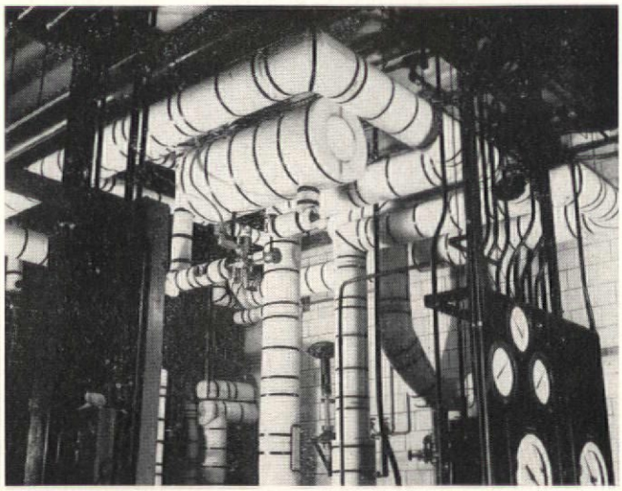
▸ At Port Huron, Mich., the same architect designed 150 houses built with precast concrete wall slabs backed with 1″ expanded polystyrene insulation. The foamed plastic was laid in a form and 2½″ of concrete poured atop it, resulting in excellent bond between the two materials. Interior wall surfaces were plastered after erection.

▸ An experimental building at the University of Michigan is enclosed with 1½″-thick plastic sandwich panels developed by the Haskelite Co. (photo above). Composed of a self-extinguishing foamed polystyrene core between 0.06″-thick glass-fiber reinforced polyester skins, the panels are stable between a temperature range of –60° to 390° F. and have excellent performance characteristics—weight 1 psf; "U" value 0.15; on a span of 6′ they will support a load of 72 lb, with 4.89″ deflection before failure; and take 800 lb. impact load before rupture.

Curtain walls have several parts—skin,

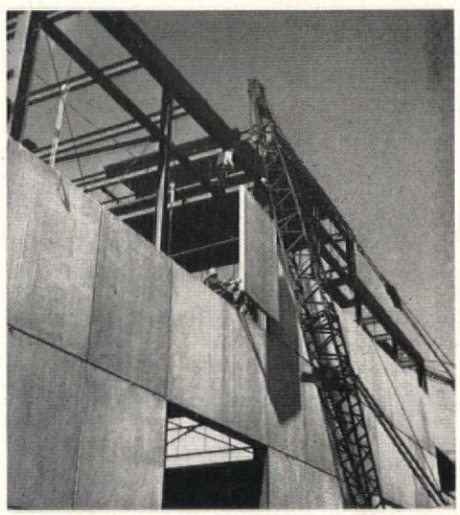


Foamed styrene "log," 9′ long and 30″ diameter (top), weighs only 45 lb. (1½ lb. per cu. ft.). By addition of methyl chloride, a liquid styrene is expanded 40 times to form "logs" which are then sawed into boards."



Foamed styrene cover insulates pipes leading from refrigeration compressors to cold room. Completely water resistant, material has compressive strength of 3,000 psi, "K"-factor of 0.23, costs 15¢ per bd. ft.

Insulation "boards," of foamed styrene 9′ x 3″ thick insulate cold storage warehouse. Boards span steel joists 36″ o.c., are topped with ¼″ cement and built-up roof. Underside of plastic "boards" remains exposed.



Precast panels by Marietta Concrete Co. are insulated with 1½″ foamed styrene between two 1¾″ slabs of wire mesh reinforced concrete. Concrete bonds directly to plastic, requires no mechanical connections.

and its excellent insulating qualities

insulation, vapor barrier and joints—each of which must work successfully.

PROTECTIVE SKIN. Laminated plastic skins of glass reinforced polyester are hard, tough and can be made with tensile strengths up to 100,000 psi (obtainable in one direction with glass-fiber reinforcing stretched in that direction). Polyesters are the easiest of the thermosetting plastics to mold with low temperatures and pressures, and have generally good weathering properties (except under conditions of unusually high temperature and humidity when they might absorb moisture and develop crazing).

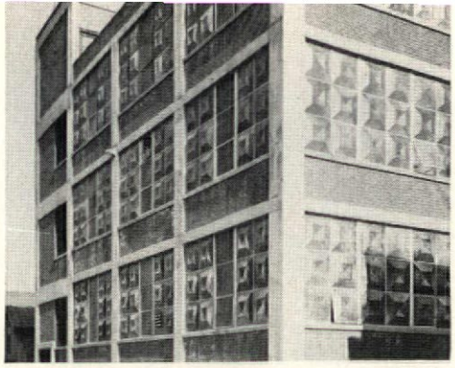
Although reinforced polyester costs four to five times as much as stainless steel or aluminum on a pound-for-pound basis, the costs of sheeting are comparable because tooling up to produce sheet metals costs about ten times more than to produce laminated sheet plastic. Other factors also favor the synthetic materials: 1) while ⅛″-thick steel plate weighs 5.1 psf, ⅛″ reinforced polyester weighs under 2 psf; 2) plastics are easy to cut, to machine and to bond with an insulating core, thus reducing fabrication costs; and 3) plastics can be integrally colored, need little maintenance.

INSULATING CORE. While plastics are fairly good insulators in themselves (almost as good as timber), they are exceptionally good insulators when expanded by foaming (mostly done with the polystyrenes and the isocyanates). In addition to a low K factor (0.25), these foamed plastics boast these advantages: 1) light weight—only 1.3 to 4 lb. per cu. ft.; 2) good compressive strength —3,000 psi, which provides useful shear strength between the two protective skins of a wall panel; and 3) excellent water resistance and negligible vapor transmission —thus foamed plastic insulators can double as vapor barriers. Costs of the foamed plastics vary between $1.60 and $4.00 per lb., or 14¢ to 40¢ per sq. ft. for a 1″ thickness.

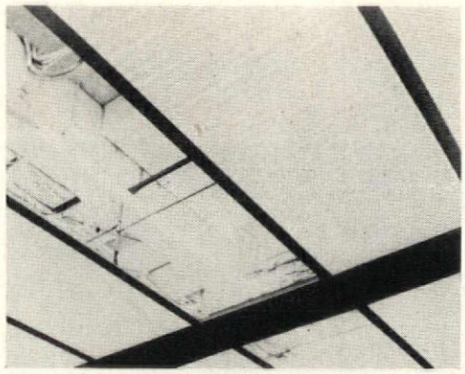
EXPANDING JOINTS. Due to their light weight, large plastic sandwich panels can be used without complicating erection procedures. But when mounted on a steel or concrete frame, the expansion differential between plastic and steel or concrete must be considered. The coefficient of expansion of reinforced polyester (0.000035) is five times that of steel, 4½ times that of concrete, three times that of aluminum. To prevent buckling of the plastic panels or cracking around bolts, the frame must permit movement between panel and supports.

Considerable research is still required into techniques for sealing joints. The best method at present is to seal joints with neoprene gaskets and cover them with 4″- to 6″-wide polyester tape.

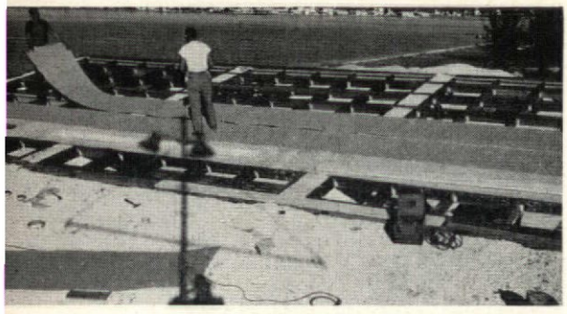
Acrylic plastic dome on roof of Princeton's architectural laboratory is 7′ in diameter, formed from ⅜″-thick sheet. It is held in place by simple clamps on circular flange.



Shatterproof reinforced polyester windows at Molded Insulation Co. plant in Philadelphia are curved outward 3½″ for strength and to catch sunlight. Plastic is 1/16″ thick, weighs 7½ oz. per sq. ft. and has light-transmittance of 78%.



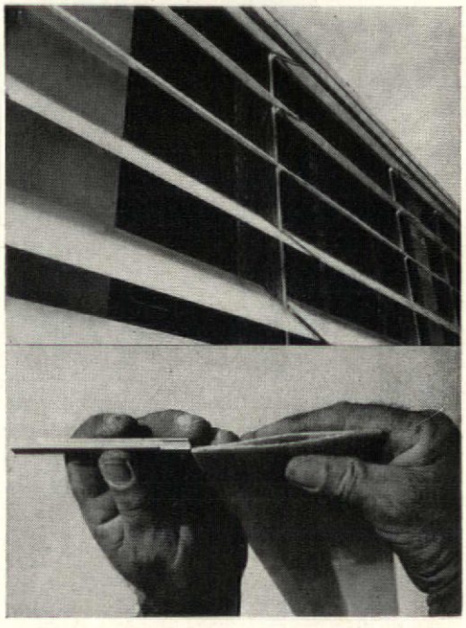
Vinyl diffusing panels, in Manufacturers Trust Co.'s New York office, are flexible and corrugated for transverse rigidity. Installed cost, with aluminum supports: $1.50 per sq. ft.



Corrugated roofing sheet at Fun Fair, Miami Beach, Fla. is continuous, flexible, translucent, colored. Glass-fiber mat is impregnated with polyester resin, sandwiched between clear cellulose plastic.

Clear acrylic windows proved shatterproof when Hurricane Hazel wrecked Keystone Refining Co. plant in Philadelphia. Window in foreground was blown 100′, yet remained unbroken.

Photos: courtesy Rohm & Haas Co.; US Rubber Co.; Marlux Co.; Alsynite Co. of America; Progressive Industries Inc.; Bakelite Co.; Eastman Chemical Products, Inc.; Triangle Conduit & Cable Co.



Reinforced polyester louvers at Russell Reinforced Plastic Corp.'s Florida office building are given strength and rigidity by double plastic skins, welded together at edges and held apart along the center by aluminum rods.

Rigid polyester sheet carries weight of workmen. Corrugated panels are 11′-8″ x 40″, 0.060″ thick, weigh 8 oz. per sq. ft. Cost: $1.60 per sq. ft.

Plastics prove ideal for special lighting problems . . .

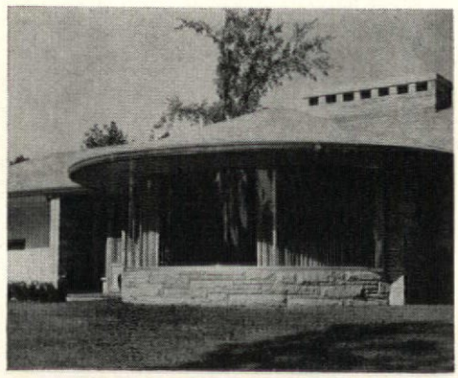
Today glazing and lighting applications probably absorb more than half of the solid plastics that are used in the building industry. There are good reasons for this: 1) light-transmitting plastics can be simply substituted and installed in place of opaque materials; 2) their lightness and shatterproof qualities make them preferable to glass in certain locations—for interiors, in large, translucent ceiling fixtures, and for exteriors, in stadium overhead pressboxes and around school playgrounds; and 3) their degree of translucence can be usefully controlled from zero to 90%.

For outdoor uses corrugated sheet plastics, usually glass fiber reinforced polyester or polyvinyl chloride, cost perhaps twice as much as glass, but are half the weight and are easier to install. They can be sawed to fit, are usually screwed or nailed to a wooden sill. Acrylic plastic domes are usually more expensive, up to $10 per sq. ft. of area covered, but arrive as package units complete with flashing and edge protection.

The acrylic plastics offer best weather resistance and light-transmittance. Their strength properties are also good, but should not be overworked or crazing and creep may develop. Allowable working stresses for continuous loading are 1,500 to 2,000 psi.

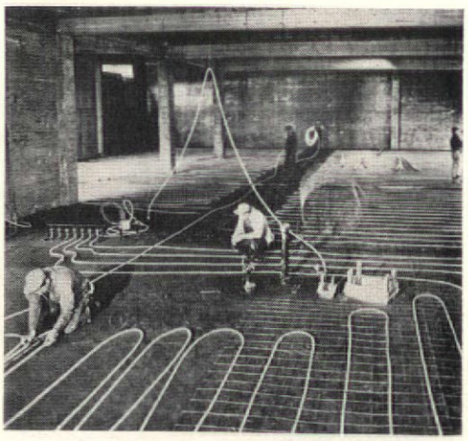
The polyesters are usually reinforced with glass fibers giving a translucent effect. They are produced in corrugated rigid sheets having high strength (30,000 to 46,000 psi flexural) and, being thermosetting, also have good resistance to heat.

The polyvinyls have extreme toughness and are self-extinguishing, but tend to darken eventually when used outdoors. They are produced by a calendering process in continuous corrugated lengths (up to 12′ wide) that are very thin, usually translucent, and can be rolled for easy storage and transportation. (See ceiling picture, above.)

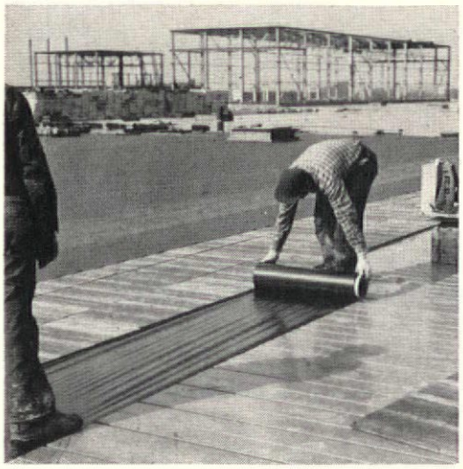


Curved picture window of preformed sheets of ¼″ clear acrylic used in Architect Talbert Abrams' house proved economical because flexibility simplified installation. Cost was less than one third that of curved plate glass.

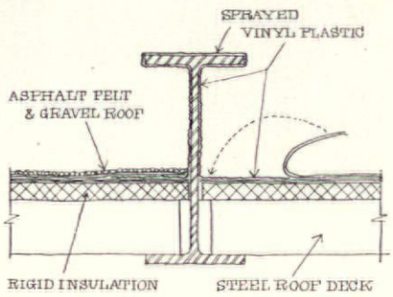
Cocooned hotel: 15-story Carlton Hotel at Tyler, Tex., shown before and after concrete was sprayed with 30 mil veneer of gray and green polyvinyl chloride acetate. Plastic sets into a flexible coating with life of eight to ten years. Cost: 45¢ per sq. ft. Architects: Design Inc.



Polyethylene radiant piping halved installation time on warehouse construction. Pipe is covered with wire mesh and filled with water under pressure to prevent collapse during pouring of 2½" slab. Piping withstands 120 psi at 120° F.



Fire-retardant vapor-barrier is unrolled over steel deck of Ford Motor Co.'s new engine plant at Brookpark, Ohio. Polyvinyl chloride skin is 4 mils thick, costs 3¢ per sq. ft.



Exposed steel is "mothballed" with sprayed vinyl chloride acetate to simplify flashing at Newton, N.J. school, where steel roof deck is carried on lower flanges of welded steel bents. Architect, J. C. van Nuys Associates.

Anticorrosive piping of cellulose acetate butyrate at Wilmington (N.C.) generating plant was laid with solvent cement and slip-sleeve couplings. It was laid in half the time and lasts four times as long as metal pipe.

. . . and hundreds of other building applications

There are hundreds of uses of plastics inside buildings where their advantages tend to offset their comparatively high raw cost. Besides the well-known interior tile and tabletop applications, plastics are used extensively in moisture and vaporproof films, piping, electrical conduits, ducts, hardware.

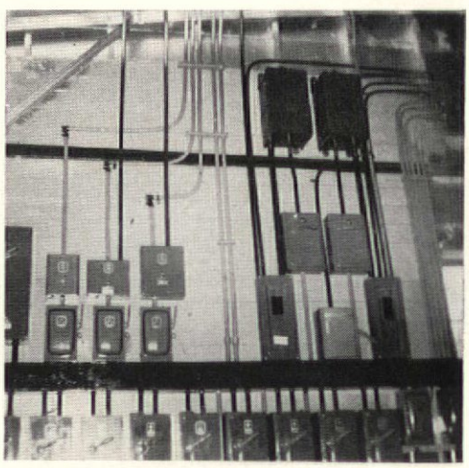
Plastic films are made of polyethylene, polyvinyl chloride and a new flexible polyester (polyethylene terephthalate). Polyethylene provides the better vapor barrier. It is used 2 mils thick on the warm side of insulating walls, with the edges of each sheet lapped 3'-6" and heat-sealed to provide a continuous barrier. The stronger polyester film (33,000 psi tensile strength unreinforced) is used 4 to 6 mils thick beneath concrete grade slabs and foundation walls. Fire-retardant polyvinyl chloride films 4 mils thick serve as vapor barriers in roofs.

Liquid vinyl chloride acetate, a sprayed plastic called cocoon used to mothball military equipment between wars, is used to waterproof exterior walls and roofs, such as the 15-story concrete hotel shown above. This plastic includes integral color, stretches over expansion joints, has a tensile strength of 1,350 psi and a 40 mil thickness. It costs about 45¢ per sq. ft. in place.

Plastic piping is made of polyethelene, tough cellulose acetate butyrate and unplasticized polyvinyl chloride. The pipes cost perhaps 50% more than conventional metal piping but are easier to transport and install, last four times as long, and permit 40% greater flow due to lower friction loss.

Plastic ducts have been used extensively for corrosive gases in industry in the form of polyvinyl chloride and stronger, flame-resistant reinforced polyester.

Other significant uses for plastics include molded nylon sliding door and elevator guide hardware, because of nylon's strength and self-lubricating characteristics.



Rigid styrene conduits are used at fertilizer plant at Davidson, N.C. to resist destructive ammonia fumes. Lightweight plastic conduit can be installed with either mechanical clamps, solvent welded joints or threaded joints.

Photos: (below) courtesy Museum of Modern Art; (top right) © Ezra Stoller

SIMPLE LETTERS without serifs have a blue glow effective day and night; their contrast with total illumination is controlled. Skidmore, Owings & Merrill, architects.

PLASTIC ILLUMINATED LETTERS from exhibit by author at Modern Museum, New York City, show design scope. Lower-case a was formed over wooden mold by Rohm & Haas, necessarily has soft outline. Other letters are built with sheet, sharp-edged, sharp-angled.

LANDSCAPE OF LETTERING

Plastic signs bring a new "heraldry" to architecture to replace jungles like Broadway's

BY ALVIN LUSTIG, DESIGNER

The use of plastic for outdoor signs has grown phenomenally since the end of World War II. One of the country's largest plastic manufacturers announced recently that one quarter of its production goes into signs. The economy, flexibility, color, translucency and weather-resistant properties of plastic makes this an ideal material for signs.

As the scope and quantity of commercial buildings expands, both the need and character of the sign has changed from its historical role, and few are the precedents to go by. In the past the function of the sign has always been minor. The sign was usually small in scale and carved into the building itself either in wood or stone. It never attempted to announce the building from any great distance and certainly no effort was made at illumination. The temple, memorial, church and monument were its chief users. The painted sign announcing the wares of the small shop, craftsman, or inn began modestly and grew during the eighteenth and nineteenth centuries.

Today the sign threatens to engulf whole sections of our environment and at times almost forms a *landscape of lettering*. In many cases it either destroys or engulfs the building that supports it.

The arts of lettering and layout have gone through the same search as the new architecture and developed attitudes toward space, scale and organization that are closely related in their design principles. These techniques make possible a kind of dramatic visual emphasis that can enhance and reinforce the way modern architecture is organized. That midpoint between archi-

PREFAB roadside signs show well-designed letters suitable to plastic, with and without illuminated background.

WELL-DESIGNED department store sign is well scaled to building form, well toned to building illumination. Letters are white by day, glow blue at night. At this size, serifs are practical. By Ketchum, Gina & Sharp.

J. Alex Langley

OBJECT LESSON: what to do, what not to do. Readability shows gain but harmony and total impact show loss as illuminated plastic sign replaces small metal letters. Frame should have been heightened to give "air"; letters improved; architect consulted.

tecture and graphic design—the exhibition —has been the most effective demonstration of this potentiality to date. Properly understood lettering and symbols can become *a new kind of heraldry* enriching the basic structure much the way painting or sculpture has in the past. The single idea that underlies the design of a building can be developed and enriched by properly related lettering. Obviously such efforts must be in the hands of a sensitive designer or architect or the result will be the chaotic vulgarity that surrounds us on all sides. Our failures are not inherent in the materials or the needs but in our own immaturity.

Signs as parts of buildings

Signs and lettering, like landscaping, are too often left out of the design and the budget until it is too late to plan them integrally. Many architects have little training or interest in the niceties or visual potentialities of lettering, and the sign manufacturers are only too happy to fill the vacuum. That they do this with crude, badly lettered signs, which destroy the integrity of the architecture as well as the landscape, is not their fault. Their designers are at the beck of salesmen whose interest is directed toward other aims. The alternative of employing a graphic designer who might understand both the needs of the architect and the subtleties of lettering and display happens only rarely, because architects consider him unnecessary and owners do not understand the added expense.

The plastic illuminated sign properly used is by far the best method of lighting signs to date. Although metal, wood or painted signs can be used more modestly, preserving the integrity of the architecture, the methods of illuminating them are too limited and quite often inadequate to combine strong display with sharp definition of the actual form of the letter. Neon lighting, for all its brilliance, usually destroys the letter form and is too intense compared with the illumination of the building itself. The great virtue of the plastic molded letter is that it is the *one kind in which the entire letter form can be made to glow evenly with light,* thus preserving its formal integrity. Also, it can be used in the more traditional way as decorative accent, letting the material of the building itself serve as background. The letter form is easily legible during the day, and at night it can be illuminated with a lower scale of intensity than is possible with neon or incandescent light.

The more elaborate techniques of placing the sign on a glowing plastic panel, as well as illuminating the letters themselves, produces self-defeating effects that are almost impossible to integrate architecturally. It is this over use of a perfectly good method that produces most of the poor examples.

The glowing panel of light against which the letters are silhouetted offers one possibility for closer coordination between the building and sign, but the design and placing of such a panel cannot be left to the discretion of the sign maker. It must be the responsibility of the architect. There is an added advantage in this technique in that smaller and more delicate letter forms are possible than in the molded letter.

Almost any approach which attempts to go beyond the two methods of the simple glow letter or the silhouetted letter against the glowing background is doomed to an unarchitectural approach. Of course when the sign is an independent element, as a pylon or standard, the freedom is considerably greater, but generally the overuse of light and color is self-defeating.

Letters that work

The character of plastic and the process of forming it into letters makes it quite adaptable to some letter forms and not so useful with others. Its *inability to hold fine lines* and the unfeasibility of lighting makes thin line letters or heavily contrasted thick and thins difficult. The formed letters are *not capable of sharp corners,* and so designs in which precise contrast of direction in the intersection is necessary are not so successful. Letters in which the serifs (cross-strokes at terminals) are not much thinner than the heavy strokes, and make curved connections with the heavy vertical strokes, are more adaptable. Single-weight scripts can be easily made although the script form itself is not too happy an architectural letter even though it finds wide use.

Naturally the *simple, single weight letter without serifs is the most successful for plastics.* Large sheet constructed rather than formed letters are capable of keeping sharp points of intersection and this method is useful for square serif letters especially when large size makes molds impractical because of cost.

The problems of letter size, scale, spacing and the character of visual relationships are complex and subtle, and would need greatly expanded discussion.

As long as we have buildings whose purpose is commercial, and which must shout their services, the problem of the sign will persist. We as architects and designers can accept this challenge and turn such structures into delightful fantasies of light, form and color which will announce themselves without question and become an integral part of the building itself. Light is one of the basic elements of architecture.

A HUMANE CAMPUS FOR THE STUDY OF MAN

On a hilltop near Leland Stanford University in California, the Ford Foundation has endowed and built a unique scientific monastery. Here, selected scholars and specialists are invited to spend paid sabbaticals working together to analyze further the essential problem of man: why do people act as they do; what are the underlying motivations and influences? In the mornings the 38 who have been awarded fellowships—economists, political scientists, psychiatrists, biologists, sociologists, statisticians and anthropologists—pursue their individual studies isolated monkishly in secluded offices turned outward toward the lonely, lovely California view. In the afternoon they repair together into central meeting rooms to correlate and confer. A sample program: experimental tests to try to clear up the conflicting theories of personality, such as the differing views of the psychiatry of Freud, Adler and Jung.

As a setting for such a serious, humane study, the group of buildings which Wurster, Bernardi & Emmons have produced is unsurpassed. It shows how much architects know about people, too. There is the warmth of redwood, a material sure of touching automatically the emotional antennae of man; there is also the more intense mental approach to modern interiors of the Knoll Planning Unit to discipline and direct the exuberance of the wood. (See p. 134 for comparison with the new CBS offices also by Knoll.) The detailing, plan and working arrangements of the frame buildings are simple and visible throughout; the whole design is deeply considerate of conditions for study.

Applauded as a masterpiece by visitors of the caliber of Clarence Stein, the group goes right back to siting for its success; the slope lies in such a way that the peripheral units are viewed *over* by the units closer to the core, and the wings are nowhere really closed in.

It nearly did not happen this way; the center came close to being shoehorned into a remodeled old mansion. Bill Wurster recalls:

". . . The building committee wandered to many sites around the San Francisco area. Then on one Sunday morning in March 1954 we saw the Stanford site with a truly undis-

TREES were carefully preserved by Landscaper Church, even when it meant building retaining walls to hold them.

MORNINGS in private offices, working alone . . . AFTERNOONS in the central complex, for group effort

Photos: Morley Baer

tinguished old wooden three-story structure. There was talk of remodeling this for over $200,000. I held myself in until we were having lunch several hours later at Chancellor Clark Kerr's house in Berkeley. When asked my opinion I burst out bluntly: "Tear the damned old house down—build the motel type of one-story thing so much used in California. This will enable hundreds of workmen to be at the site and not be in each other's way while, if you remodel, each trade waits on the other in an intricate structure of many floors. And anyway, who wants to be up three stories, in a hot attic, to hear the pecking of the typewriters through the wood floors?

"'But the time element?' they asked.

"'O.K., here it is the sixth of March, bids in six weeks, start building in two months, four months building, complete in six months.'

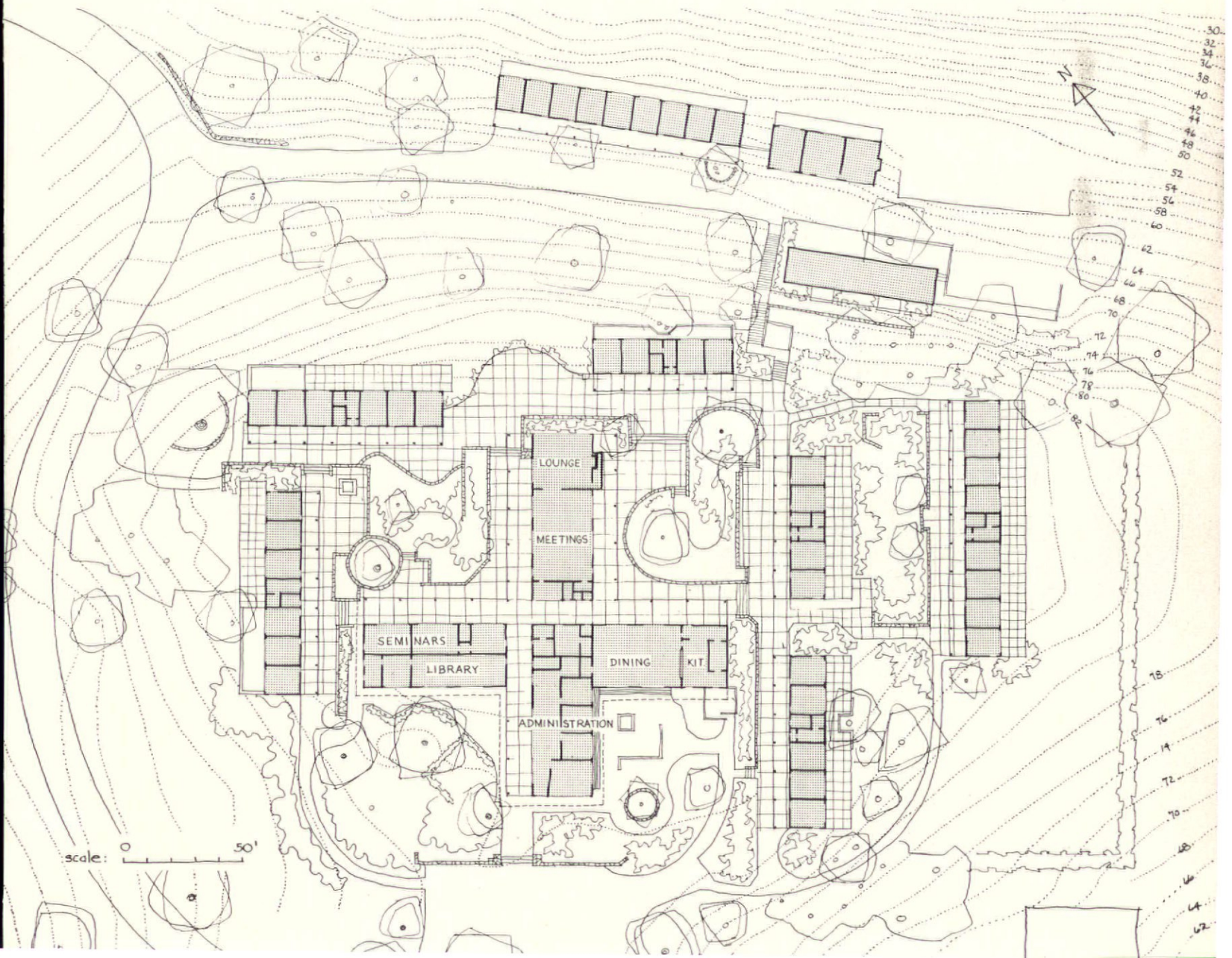
"And we did it!"

Final contract cost for building, utilities, roads, etc. was $258,000 (about $12 per sq. ft. of building). Landscaping was $54,000; furnishings $79,000.

CENTER FOR ADVANCE STUDY IN THE BEHAVIORAL SCIENCES, INC.
PALO ALTO, CALIF.

ARCHITECTS: Wurster, Bernardi & Emmons
MECHANICAL ENGINEERS: Buonaccorsi, Murray & Lewis
CIVIL ENGINEERS: William B. Gilbert
GENERAL CONTRACTOR: Swinerton & Walberg
LANDSCAPE ARCHITECT: Thomas D. Church
INTERIOR DESIGNERS: Knoll Planning Unit

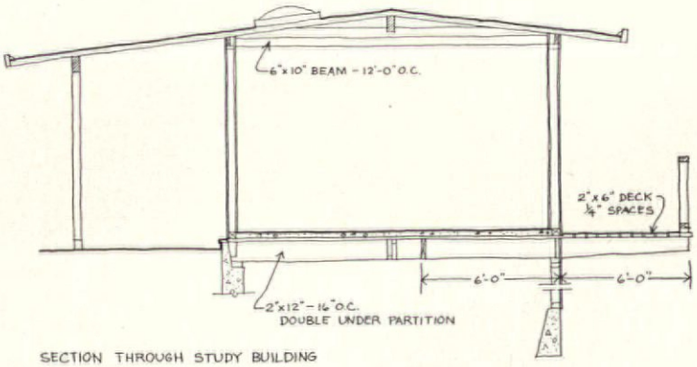
SITE PLAN puts study buildings around cross-shaped central building, creating two major courts, several minor ones



STUDY ROOM is a handsome office, which may be curtained from sun and view

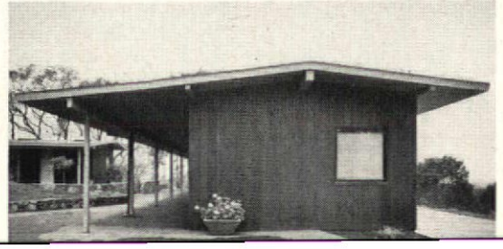
TERRACE outside is a visual extension of study-offices

ROW OFFICES are the morning habitat of the scholars. Deliberately insulated visually from one another and from the central courts, the 12′ x 14′ offices are lighted by plastic bubble skylights and by the glass end wall which contemplates the view. When the campus is enlarged, additional rows of offices downhill will not block view of earlier wings. Entire existing campus was executed by the contractor in 77 working days, after competitive bidding.

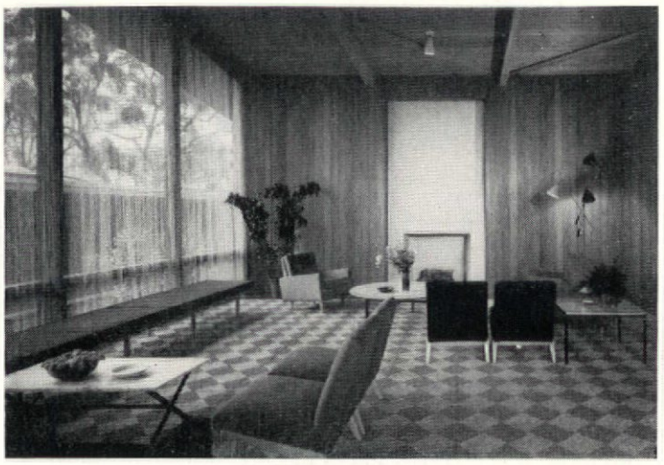


SECTION THROUGH STUDY BUILDING

SIMPLE MILL FRAME is revealed in end view

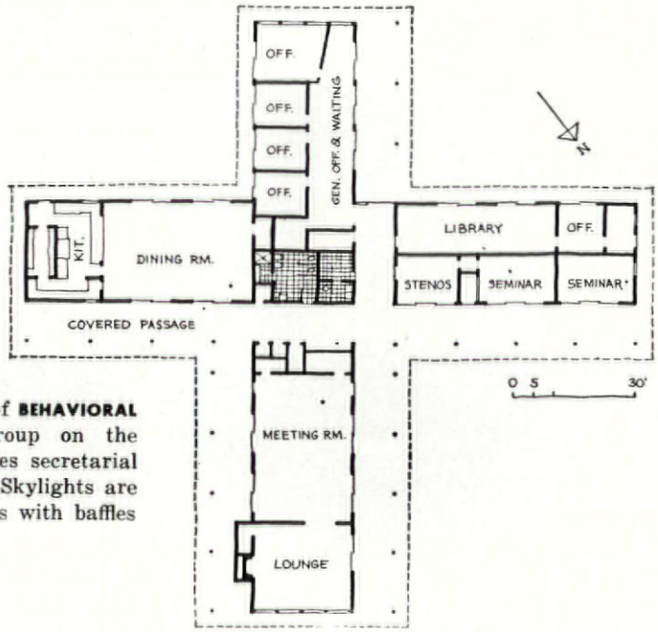


CENTRAL ROOMS come into use at lunch and thereafter, when the scientists and scholars meet to eat together, then work on in seminars. Even these community rooms retain a good deal of the view's sweep through their amply glazed walls, but by comparison, their vistas are more intimate ones than those open to the private study rooms, emphasizing the community core. It is here that the wisdom of Landscape Architect Church's careful retention of the trees counts for most.



LOUNGE: note lateral bracing in ceiling plane

LIBRARY: trees protect it from glare, with roll blinds as insurance



CENTRAL BUILDING of **BEHAVIORAL SCIENCES** office group on the West Coast includes secretarial corridor (below). Skylights are plastic roof bubbles with baffles under them.

CBS OFFICES

Interiors for East Coast executive suite—a change in pitch but not in key

WEST AND EAST—THE SIMILARITIES:

THE CLIENT: Dr. Frank D. Stanton is chairman of the board of the Institute for Behavioral Sciences, and is president of CBS.

THE FURNITURE: in both, mostly the same general forms.

THE DIFFERENCES:

THE BUDGET: low for Behavioral Sciences, not so low for CBS—the difference between stock and made-to-order.

THE IMPACT. At Behavioral the interiors are composed as counterpoint to strong architecture. But the CBS offices had to be created in a vacuum of identifiable architecture.

THE CHARACTER of the rooms themselves. At Behavioral they are extroverted. The landscaping among the buildings and the views around them are incorporated in the interior design. But the air-conditioned CBS offices are introverted, shunning the New York view, masking the windows with translucent plastic screens. Also, CBS's layout started complicated, had to be *made* simple by designing partitions and closets around existing pipe runs, ducts, etc.

THE FINISH. The rooms in California are shaggier, toothier, with a much wider range of finishes—matting on the wood floor, walls of redwood and painted T&G ceilings. The offices in New York have a more subdued, delicate range of contrasts, running more to the polished perfection of marble and the tight grain of oiled teak, with wall-to-wall carpeting.

COLOR. In California the colors are softer, more "natural," running more to browns, but not so pure in pigment. In New York the colors are more sophisticated—black and white with pure accent colors in small areas.

BY THE SAME DESIGNER

The intricate similarities and the sharp differences between the interiors Florence Knoll has designed for the Center of Advanced Study in the Behavioral Sciences building and the executive floor of Columbia Broadcasting System's New York headquarters are listed below (left).

Yet this listing of tangibles does not really get at the significance of these two first-rate designs. One design is the suburb of the other; together they show how skillfully the details and the finishes—the vocabulary of this modern language—can be varied to produce environments with almost any pitch, with separate personalities. Another comment these two designs make is, of course, on the ever increasing importance of furniture to modern architecture. This is why so many architects have taken to designing furniture.

And all this is another evidence of the maturity of the modern idiom. The Bay Region style and its antithesis, the Manhattan Island style, make moves toward each other in the Behavioral Sciences and CBS designs. The sharpness and intellectual precision of the furnishings in California extend the range of the relaxed, romantic wood-frame architecture; 3,000 mi. east, in the orientalism visible in many touches in the CBS offices, you see transmuted the grace and elusive charm of the handicraft past which is an old knowledge of West Coast designers.

Idaka

CBS executives sit in neat splendor

The network president and vice presidents who keep business hours on this floor should not have too much difficulty in maintaining the proper mental pitch for their demanding trade. The suave drama of their carefully controlled stage offers many areas off which to bounce ideas, in a recent phrase of Madison Ave.'s swift jargon. (Another regional characteristic appears in tangible form —some of the chairs are upholstered in sleek gray flannels which are not far from the favorite suitings of the correct New York executive.) Not all offices on the floor were rephrased in Knoll language; the chairman of the corporation's board kept his period decor.

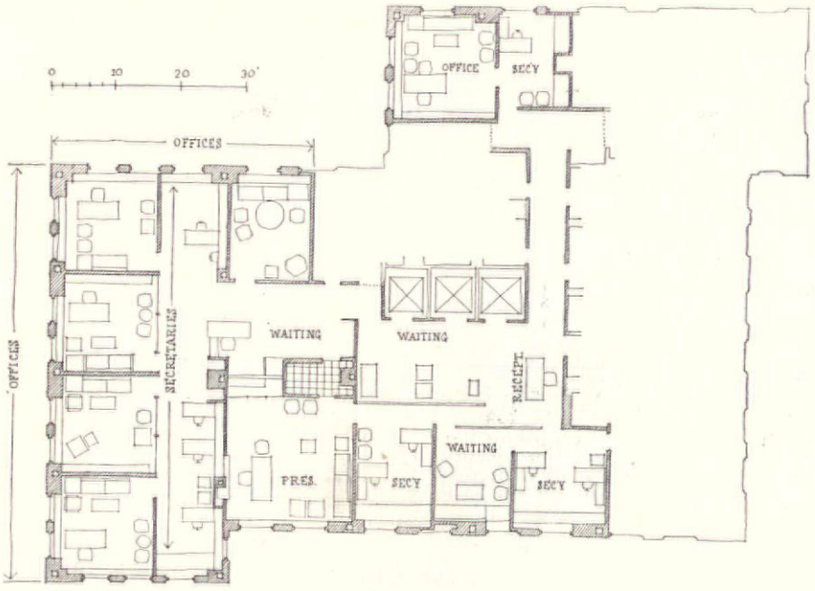
The design technique virtually eliminated walls by widening traffic ways here and there into secretarial "galleries" and secondary waiting rooms. This helped office shapes too, cutting them down more nearly square than usual.

INTERIOR DESIGN: Knoll Planning Unit; Florence Knoll, designer

OFFICE WITHOUT A DESK. This executive's room has the usual desk impedimenta built into a cabinet at the end of the couch, telephone included. The round table is the work surface.

RECEPTION ROOM adjoining elevator is entirely enclosed, without windows. But the glass panels at the rear of the space are back-lighted to give an impression of daylight. Panels' metal frame echoes that of furniture.

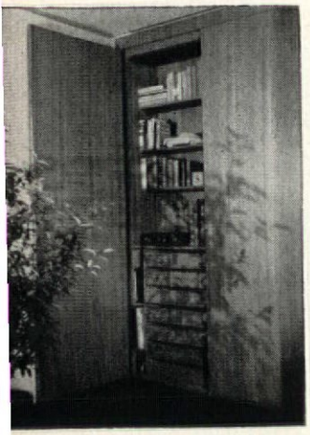
SECRETARIAL "GALLERY" has typical tailored secretarial port in foreground. The specific offices of executives served by these secretaries are behind wall to right; this area can also be a secondary reception space.



SPACE ORGANIZATION includes several secondary reception rooms. These are achieved by simply widening the space, making it better than "corridors," and simpler.

Photos: (below & opp.) Idaka; (bot.) Damora

TYPICAL OFFICE: the same light fixture is used here as in many parts of the Behavioral Sciences group. At CBS, however, it is backed up by built-in lighting with a wider range.

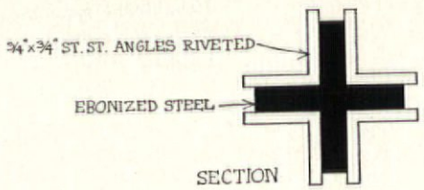


BOOKS

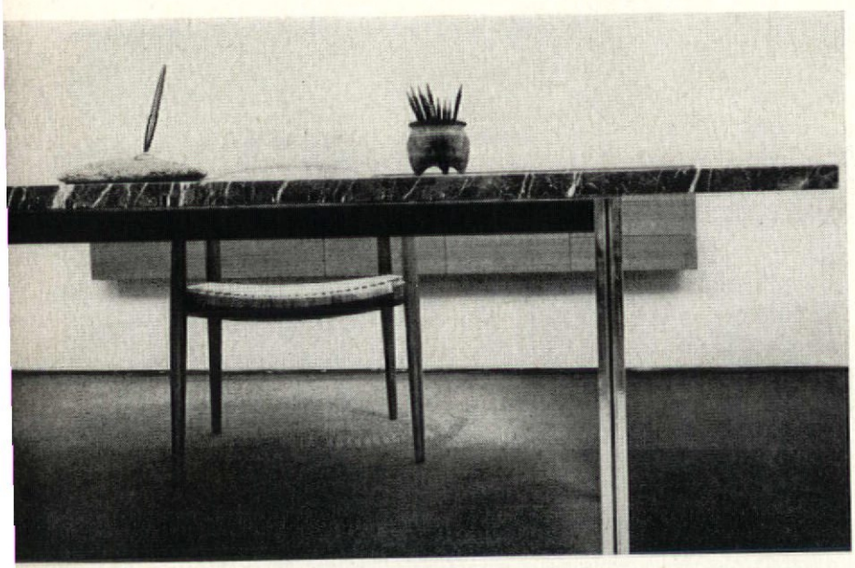
BAR

COLOR AND BLACK-AND-WHITE TV

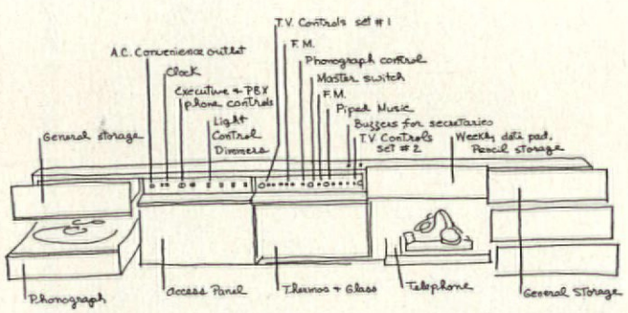
STORAGE WALL. The functions behind this plane of the president's office range from ice cubes to symphonies, all precisely integrated in a comparatively small space, all concealable.

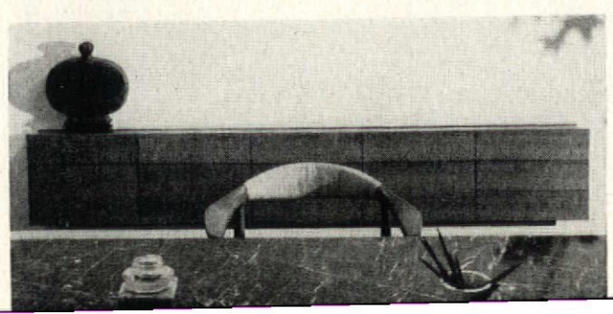


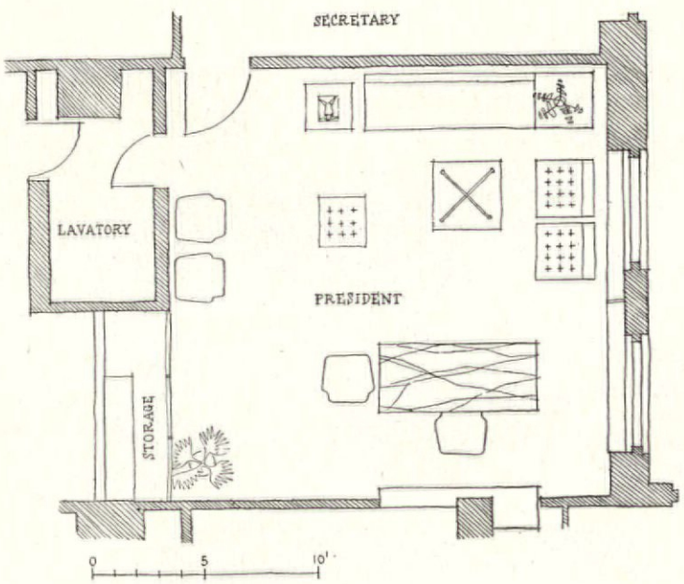
SECTION



PRESIDENT'S TABLE DESK, marble on steel legs, is detailed for strength as well as elegance. The black painted steel (see small section drawing of leg above photo) continues at an angle to form the horizontal structure. Below is Florence Knoll's diagram of the cabinet behind this table.

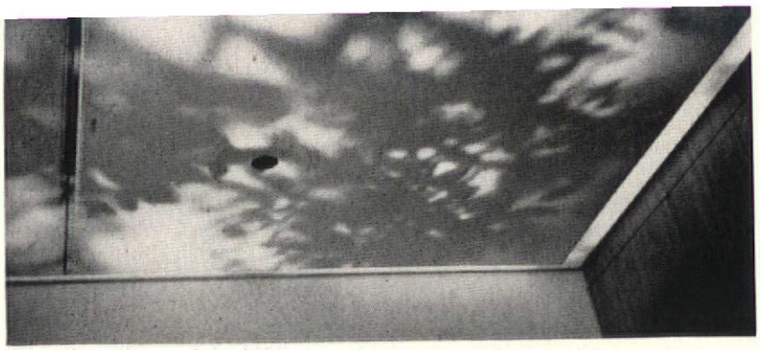






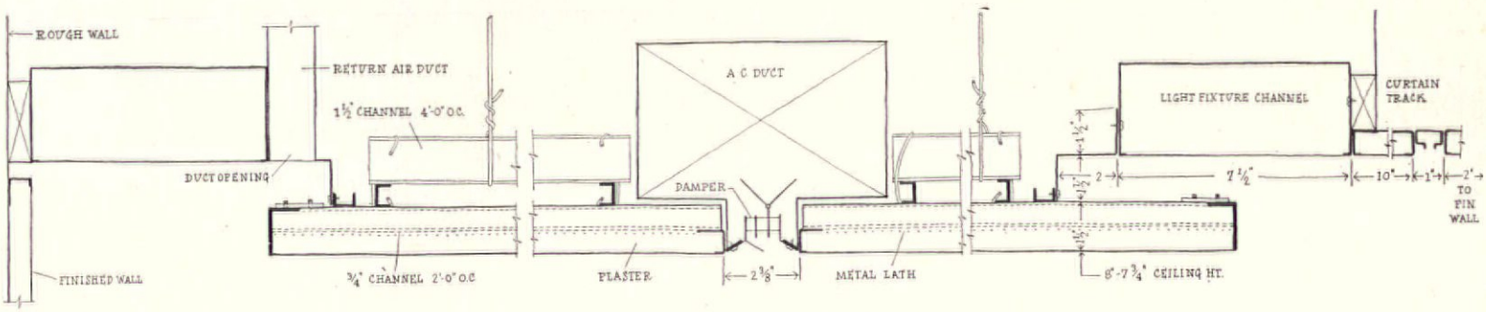
PRESIDENT'S OFFICE is a large and vivid expression of an executive who customarily expresses himself right down to a personally chosen paper clip. The room is meticulous and exact, without going dead.

Designers and builders of the cabinets which surround President Stanton gave him precise places for storing all things to a really amazing degree. (The "flying bridge" of controls and incidental storage—left—which backs him up is a prime example of this exactitude.) All hardware is minimized—there are no projections at all from the storage wall, for instance. The wood is oiled teak; the light wood chairs, for pulling up to the table, are a Danish import which match. The lighting and air conditioning are minimized, built into the plane surfaces and intersections, for a sleek and articulated room.

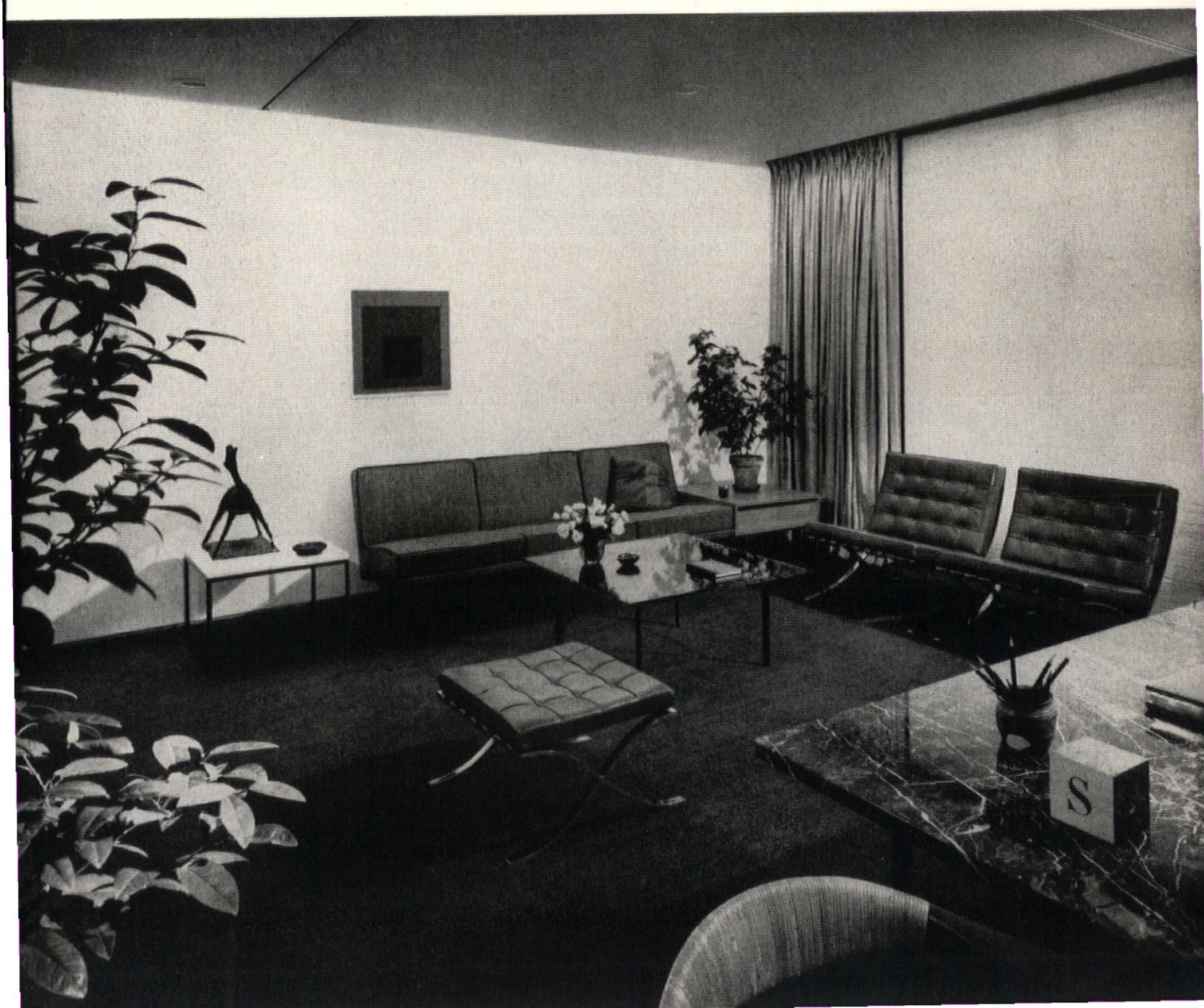


Photos: (below) Damora; (others) Idaka

AIR CONDITIONING is spread from slot diffusers, a deliberate extension in the overhead plane of the over-all design of the room. Dappled effect on ceiling in photo (left) is caused by low lighting under leaves of lemon tree.



LIGHTING is combination of recessed downlights plus edge lighting around hung ceiling plane, all on a dimmer control. Art and sculpture selection was done by Florence Knoll and the CBS president.



ROUND TABLE REPORT:

HOW TO DESIGN A GOOD ARCHITECT

Educators and architects at Princeton conference ponder the problem of training the young men who will shape the second half of this century

McLAUGHLIN SMITH SHAW BANNISTER

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Richard Neutra and Robert E. Alexander
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Skidmore, Owings & Merrill
New York

Louis I. Kahn
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Enrico Peressutti
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Milan, Italy

Alfred Shaw
Shaw, Metz & Dolio
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Perry Coke Smith
Voorhees, Walker, Foley & Smith
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Hugh Stubbins Associates
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Editor
ARCHITECTURAL FORUM

At a time when the building industry is pondering the many technological advances of the last 50 years and their effect on the role of the architect, a group of educators and practitioners assembled at Princeton to discuss the training of tomorrow's leaders. Called together by Director Robert W. McLaughlin of Princeton's School of Architecture, this round-table conference represented a broad, geographical cross section of the profession and its schools. Observed McLaughlin: "We were about half pedagogues and half practitioners, but it was hard to tell us apart, because most of the pedagogues had practiced and most of the practitioners had taught."

Privileged to participate in the conference, FORUM presents below excerpts from the transcript which Princeton will publish in book form this month.

BUNSHAFT: We are all here because we feel that there is something wrong in the end result of the buildings being built in this country. We hope through education to improve that situation. I know of very few buildings that have fallen down or have leaked. Somehow we have taken care of the technical details. What is lacking is that the buildings are not very beautiful. Neither do they fit into the community. That is the fundamental of our problem.

STUBBINS: If all architects are expected to be skilled in the organization of space and in esthetics, we should not have as many architectural students as we have. An architect is not only an artist, he has to be practically all things to everybody and sometimes even a magician—so much so that it is difficult to imagine the architect today as one man. He must be a member of a team. Architectural students should all be exposed to design courses, but I don't think we ought to expect every student to be a design genius. Those men who are not proficient in design should be channeled into some other related aspect of architecture, so that they can be useful to the few people who have the innate ability to be designers. In my opinion, a designer cannot be made—he is born.

BUNSHAFT: Design should be the first basic thing the student should learn. (He can get into building codes and working drawings, etc., when he gets into an office.) He should be aware of what the other subjects are and what he will someday have to deal with. I think good buildings of tomorrow are going to be a closer integration of these many fields. However, I don't think the student can in five or six years learn all these subjects. Schools still seem to be attempting to teach the entire field of architecture in some detail. All students ought to have design—at least they should have a full exposure to design and become sympathetic to it.

BURCHARD: If a man goes through medical school, he knows he's got to be an intern before he goes into practice. If we train a chemical engineer, we train him to go out to work in his field. But we turn out these thousands of architectural students from schools and only a few can go to work for firms in which they can learn the things they don't know. Many start practicing themselves. Those who practice themselves have to make their own mistakes. This hurts their pocketbooks. If a doctor's mistakes are buried, this, unfortunately for society, is not true of the architect's.

SMITH: The most important thing that can be taught in our schools of architecture is a pholosophy of responsibility, as a framework on which to hang the techniques that we teach. People who practice with a sound sense of responsibility are people who do a great deal of work, because that is a commodity that other people want to buy and for which people have money to spend. They understand responsibility better than they understand esthetics or the organization of space. Larger firms such as mine would find more useful a man who came out of school with a grounding in some of the ideas of professional responsibility because then he could be taught techniques with relative safety.

WURSTER: When we gave up the apprentice system and put architectural education into the universities, we did it at certain sacrifices which need to be made up by work after graduation. When we talk about archi-

KAHN HASKELL ABRAMOVITZ BURCHARD KAMPHOEFNER BUNSHAFT SERT ALEXANDER PERESSUTTI WURSTER STUBBIN

tectural education, we should talk about a ten-year cycle of which some portion is spent in the university, some in office, some in travel, some in the building industry, and some in any other phase of architecture.

BURCHARD: To take the medical analogy again—if a student goes into medical school and has bad hands and has no hope of becoming a surgeon, this does not mean he will not become important in the profession.

ABRAMOVITZ: I react against a theory of a mastermind with anyone who doesn't fit becoming a private or corporal. I also want to react to what Jack Smith said about responsibility. It might be important to teach the architect some program in school that makes him a complete average man—a complete practitioner—so that he can have self-confidence whether he goes to practice in a medium-sized office or a big office.

You should teach only a smattering in school of what people can get out of later practice; you should emphasize in schools whatever is hardest to get in practice.

BURCHARD: Can you say what some of these things are?

ABRAMOVITZ: Building law, specifications, bidding procedures, professional ethics.

STUBBINS: I'm sorry that I left the impression that I proposed a mastermind designer. I meant exactly the opposite. If architecture is to be teamwork, students should take the same courses but might be allowed to major in different fields. Taking the same group of courses will make each one aware of the problem as a whole, while the concentration would allow the student to pursue the particular phase of the subject that interests him most and for which he has an aptitude.

BUNSHAFT: When I was in school they were still dreaming of this idea of making a student a broad, complete architectural man. This idea of being liberal is carried too far; things get hopelessly confused. We should have as much discipline as the medical profession or the engineering profession.

BANNISTER: In the study of design, students should be guided toward a creative understanding of all factors which influence the result. For example, courses in building construction and structural theory should lead not to just acceptance of standard solutions, but to a command of principles which will permit the designer to apply them creatively. The designer in the office must today be the actual craftsman. He must know, for instance, a great deal more about the materials and methods of construction than the shop fabricator or the mechanic in the field. Where formerly an architect often left the working out of such details to the craftsmen on the job, today these details must be clearly fixed by explicit working drawings and specifications. It is this change which, during the past century, has transformed practice into a much more comprehensive and precise process which demands a fuller creativeness.

KAMPHOEFNER: As I look around the schools, it seems to me that we're all trying to train designers. We graduate about 20 students in our school a year and I know that they have varying degrees of proficiency in design. The ones who are the weakest in design are the ones who are likely to insist on going into their own independent practice first. They are the ones who are most difficult to work with; but I think we ought to help this kind of boy to find himself and help him to develop in the area of his interests, and not discourage and confuse him if he isn't proficient in some of the things that perhaps we think are the most important.

SERT: Subjects should be grouped in such a way that there are certain subjects that all architects should have. The basic education would include a broad knowledge of economics, a knowledge of structural possibilities and a broad knowledge and appreciation of design. That would be the basis. From then on there would be possibilities in the schools to have elective subjects to route those architects who have certain feelings for these other fields. It has been said that we want emphasis on teamwork and I believe that this is the future way of working. If the team is composed of people who know different things, then the work will be done in a faster and more intelligent manner. Now for teamwork you have to prepare people to do different things and at that same moment specialize them in one thing.

PERESSUTTI: Each one of us is different. When we are working as architects, we are each in a different environment, in a different society, in different places and so forth; and because of that I don't believe in emphasizing a technical training for an architect. I believe much more in a moral train-

continued on page 150

Should teachers be practitioners as well?

BURCHARD: The teaching faculty should be competent and should practice.

WURSTER: I've often said that I would not be head of a school whose design faculty was not practicing architecture.

BANNISTER: Are you talking about full-time appointments or part time?

WURSTER: I'm talking about whole time.

BANNISTER: How much time do you feel could be allowed?

BURCHARD: Half of each week.

WURSTER: A faculty member at the University of California must have 14 contact hours a week, or more. This means that he has two four-hour periods of criticism and six hours more than he teaches in graphic courses, in thesis work or in jury work. We have this at California as they have at MIT. Because we are in a metropolitan area, we are able to get people on a part-time basis.

How long should architects go to school?

BURCHARD: No formal architectural curriculum should exceed six years. Anybody want to reduce that figure?

ABRAMOVITZ: How old is the average student when he graduates?

WURSTER: About 24 or 25. The five-year curriculum followed by the usual run of collegiate schools of architecture is a happy medium between four years and the extended period. We have a five-year bachelor's course and another year for the master's degree.

SERT: We only have a master's.

BANNISTER: The five-year professional curriculum, plus a three-year candidacy, plus two years of military service now means a minimum age of 28 at the time of licensing.

Accidents of health, academic difficulties, a longer term of practical experience, and any participation in graduate studies can raise this age into the thirties. One proposal is to permit selected students to enter architectural school directly from the third year of secondary school, thus forming an eleven plus five system, instead of the usual twelve plus four.

ABRAMOVITZ: Our most difficult problems are with the older men coming out of school. When they come out so old, some must face problems in life that force them to make decisions against their will. Therefore, I'd like to see them get out of school earlier. I've wondered whether you might develop a four-year course and then let a man start earning his living and have schools like Princeton or Columbia give night courses in the cities where a great number of men could come and continue on in the evening for a couple of years, so they could do both together. There might be an extension of Princeton in Boston or New York.

How can architectural schools attract promising students?

WURSTER: The question is how to get exciting students into architecture, how to get your share of the first-rate people who believe in the importance of architecture. I'll mention one course we are starting. We are giving a new course starting with the freshmen this year called "Introduction to the Professions." We are really trying to explain architecture, landscape architecture and city planning.

BURCHARD: We ought to have a general course on the subject of architecture. We ought to educate this man who will be the client before he leaves Princeton. Indeed, I can hardly press this point hard enough. A university like Princeton produces a great many kinds of future leaders of our society. Some of these leaders will be big buyers of architecture, others in points of decision as to important public or private buildings. They will have something to say about what kind of buildings our nation builds abroad. Yet I know enough of university curricula to know that most undergraduates can go four years to Harvard or Yale or Princeton and never have any formal visual stimulation at all, never any discussion of esthetic principles of painting or of architecture. As future customers they are almost illiterate about what they are going to buy. Yet great architecture needs more than great architects; it needs great buyers, too. And most buyers are not great buyers —least of all are university men great buyers. Is there a general responsibility to the university and to society which is at present being neglected by the schools?

McLAUGHLIN: I think it's an excellent thought. It would have a very good effect on the faculty, to try to put some of our convictions about architecture into language for the layman. It could be a wonderful discipline for us and would build our stature on the campus.

ALEXANDER: The selection of the most vital students is the most important thing. I don't think it's done by any selection committee, but only by the prestige of men you have here on the faculty. Examine who they are and what name they have and what excitement and commotion they are causing in the world of architecture. I should think that one means of going about that might be the selection of an alumni committee of sponsors of the architectural school who are not alumni architects, but who are now leaders in finance, business, commerce and industry—of which you have many—who are great names in the main stream of our society in America, and who might be interested in the mission of rebuilding America.

BUNSHAFT: There should be a basic course in what architecture is, what it represents, what it does in the community, to be given as an elective course for the university. There are so many men coming out of this place who, during the course of their lives, are going to build something and know nothing of the procedure and the position of the architect. This we could call architectural propaganda.

Are specialist teachers needed to supplement the faculty?

STUBBINS: Theoretically, it would be nice for the architectural student to utilize the regular engineering, mechanical equipment, heating and ventilating courses of the university—but as a practical matter, it does not always work to the advantage of the student. This is especially true in structural engineering. The architect is not going to be a structural engineer. He doesn't have to know the detail required of an engineer and he should have a more imaginative approach than most engineers have. So a special course is necessary in the engineering curriculum or in the architectural school.

BURCHARD: I have found that the greatest specialists, the ones who really know their stuff, can explain difficult matters to intelligent laymen; only the insecure and the young require jargon. If our architects are to perceive the high meaning of other areas, they had better see these meanings through the eyes of an enthusiastic great man, not the words of a pedestrian pedagogue.

KAMPHOEFNER: It's difficult to get that great man committed when you need him.

SHAW: For a short time the impact of a great name gives a shock to the body and then in the long term you get used to it.

BURCHARD: I agree with you entirely about visitors. These men certainly have a great titillating effect on the university student body, but they are of no use unless there is a group of their peers to take them apart and put them back together again, to keep things going when the visitors are away, to supply the ice bags after the jag. And to be effective, I insist, the permanent faculty must be the peers of the visitors.

Should a university's architecture reflect its school of architecture?

BURCHARD: What effect should the architectural faculty have on the architecture of the university itself? There was a long period when Harvard was teaching one kind of architecture and building another kind. This is quite common in American universities. Is this good?

STUBBINS: During the time I was at Harvard, the university never, except on one occasion, consulted with anyone in the School of Architecture regarding its building or planning program. It seemed that the university had little use and no respect for the faculty of architecture or for the school itself. (The one instance was when Gropius was finally permitted to design the Graduate Center. This did not develop into any future understanding, as the next building program went to old-line traditional architects.) At Georgia Tech all the buildings have been designed by the architectural faculty.

BURCHARD: It may be neither essential nor always desirable that the architectural faculty design the buildings, but does this mean that this faculty shall have nothing to say about what buildings are built by the university, even to the point where the university says one thing with its buildings and another through its faculty?

WURSTER: We have put forward a proposal that a properly constituted faculty committee (faculty with some experience in building) can be appointed by the chancellor to choose the architects for the buildings. We've had good luck in having new faculty members chosen by a panel of the faculty, and we would hope that by this same sort of thing we might set up a process that gains good architects and architecture.

STUBBINS: That sounds ideal.

ABRAMOVITZ: I think it's the only way.

KAMPHOEFNER: Who selects the architects for Princeton buildings?

McLAUGHLIN: Princeton is governed by a board of trustees. There is a very definite line between the function of the trustees and the functions of the faculty. At Princeton building is the function of the trustees and it would be no more considered good practice for the faculty to interfere with the trustees than for the trustees to tell us in the School of Architecture what we should teach or what our curriculum should be.

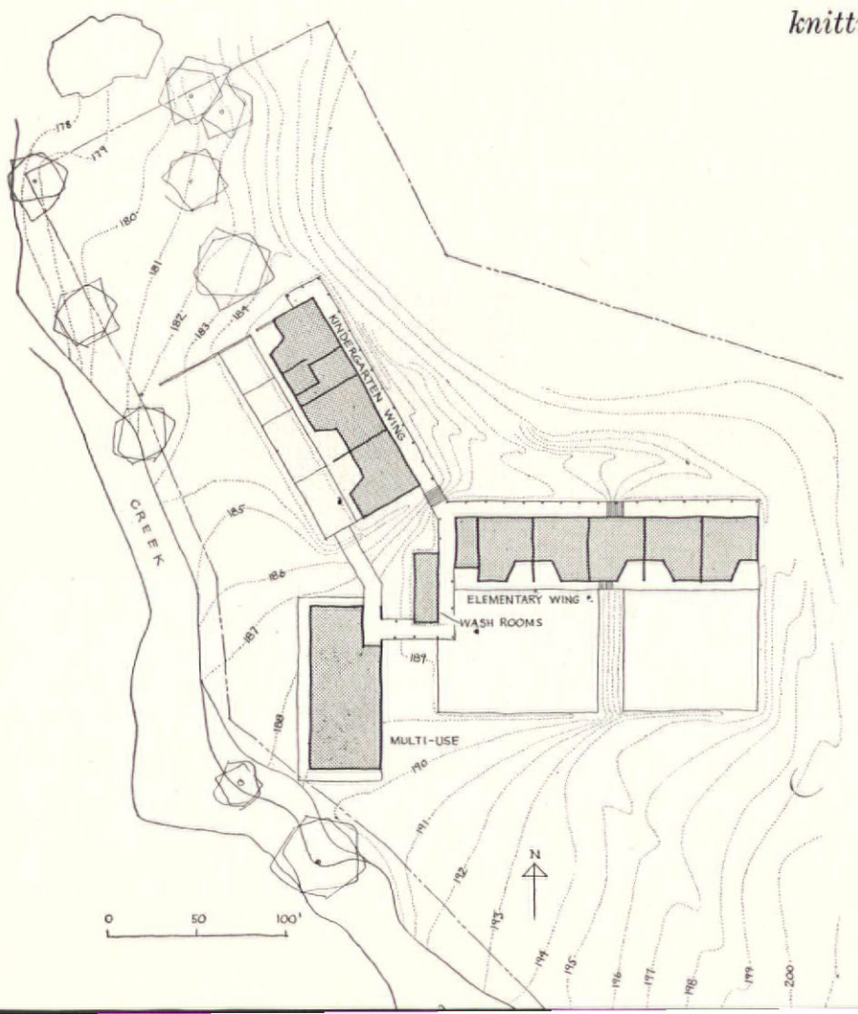
WURSTER: I wonder if the board of directors knows any more about building than your faculty who will live in the buildings.

McLAUGHLIN: As a practical matter the School of Architecture is frequently consulted about architecture but not always followed. There is no question that when you have a serious divergence as to what is being taught in the School of Architecture and what is being executed on the campus, you can have a very unhealthy situation.

Photos: Roger Sturtevant

INDOOR-OUTDOOR SCHOOL

It spotlights the problems of knitting architecture with nature



Planning of indoor-outdoor relationships has become almost as important for elementary schools as classroom design. Not many schools have the start this one did: a park of redwoods, oaks and bay trees in a canyon. But the very challenge of this existing beauty and difficult terrain brought the indoor-outdoor problem into sharp focus.

Although the school adapts to the terrain horizontally and vertically, the entire scheme has architectural coherence; this is where "slope following" designs usually fail. The design makes no egoistic attempt to use nature as a "setting" against which to show off. Basically, the design happens to be simple, with no overt novelty. But in a quiet way, it ingeniously uses natural advantages of the site: it puts them to work functionally as part of the building, educationally as extensions of the classrooms.

This job won a *School Executive* first prize. Since 1948 Fairfax School District has built three prize schools, all by Architect Reid.

ARCHITECTS: John Lyon Reid and partners
ENGINEERS: Robert E. Grady
GENERAL CONTRACTORS:
Herbert Cracker Construction Co. (classrooms)
Beacon Construction Co. (multiuse wing)

DEER PARK ELEMENTARY SCHOOL Fairfax, Calif.; eight classrooms; 305 students (35 per classroom, 60 in kindergarten).

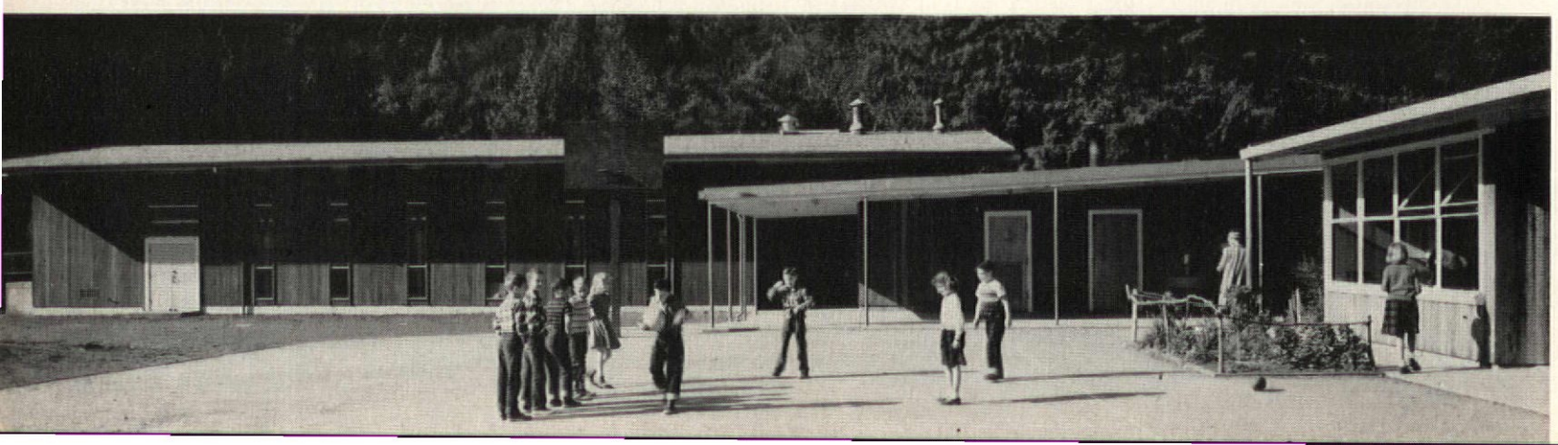
FEATURES: sensitive and imaginative use of site. ▲ Bilateral classroom lighting with heat-absorbing glass on south, tree-shaded clerestories on north. ▲ Outdoor corridors. Indoor and outdoor alcoves for each classroom. ▲ Freestanding wood arches in multiuse room, giving open-pavilion feeling to one side. ▲ Outdoor classrooms for primary grades. ▲ Three separated outdoor playcourts. ▲ Faculty room and terrace, usable by parent groups. ▲ Adherence to strict 55 sq. ft. per pupil area limitation and low construction cost without sacrifice of amenities or low maintenance.

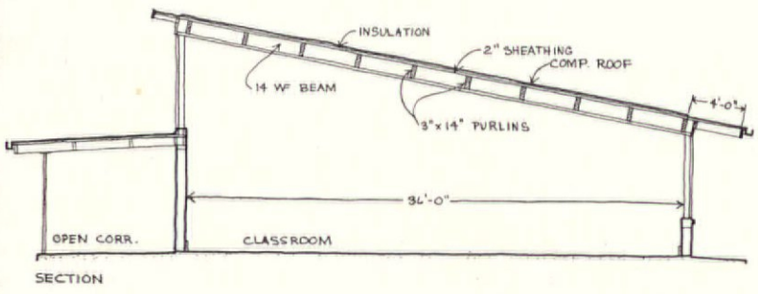
CONSTRUCTION: continuous foundations, slab on grade. ▲ Classroom framing, light steel columns and beams 16′ o.c. supporting wood joists. ▲ Multiuse wing framing, laminated wood three-hinged arches supporting wood purlins. ▲ Walls and roof, diagonal wood sheathing forming seismic diaphragm. ▲ Exterior wall finish, redwood siding; interior wall finishes, fir plywood, stucco or acoustic-backed redwood siding. ▲ Ceilings, exposed sheathing and acoustic tile. ▲ Hot-water radiant heat in classroom slabs; tempered fresh air in multiuse wing.

COSTS: construction (excluding sitework of $9,835 and architect's fee), $230,867. ▲ $13.36 per sq. ft.

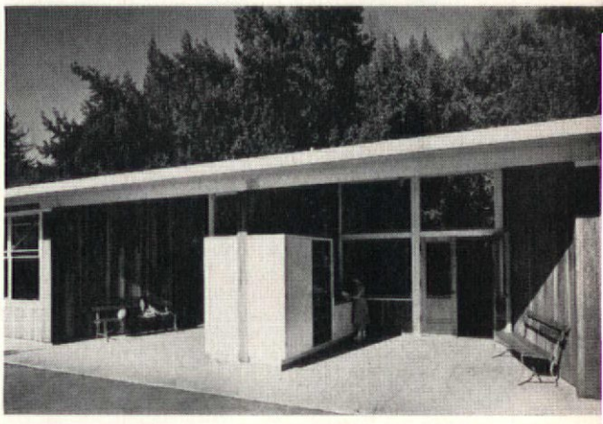
SCHOOL'S WINGS climb along relatively level areas, close against steep, wooden canyon walls. A big bay tree in a clearing that notches into the hill provides a "pivot" for the two classroom wings and their main corridors; it also serves as a bicycle rack. View shows north sides of classrooms, with large, naturally shaded clerestories above corridor roofs. Note how overlapping upper- and lower-level roofs are joined by louvers. Lower-level wing houses the primary grades and has play yard off south side.

MULTIUSE WING (left in photo) bounds the west end of the play courts which adjoin the south wall of the upper-level, upper-grade classrooms. The small projecting wing between the multiuse and classroom junction is the central utilities unit. Its corridor leads into a sheltered outdoor lobby in the corner of the multiuse wing. Between the narrow windows of the multiuse elevation shown in photo are folding tables.



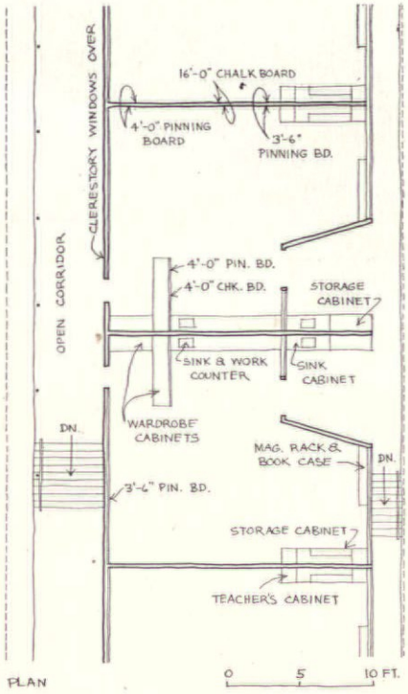


SECTION



OUTDOOR ALCOVES, typically paired, are divided by a redwood-sheathed center wall. Each classroom's outdoor work-storage equipment includes sink, counter space, open cabinet and closed cabinets. Casework is painted fir. In the upper-level wing (shown here), alcoves adjoin paved play courts. In the lower-level, primary wing they adjoin outdoor classrooms, with play yard in a redwood grove lying beyond.

CLASSROOMS have shed roofs, yielding big north clerestories. Each room has a work-and-storage band of cabinets, chalkboard and tackboard running along one interior wall and continuing into outdoor alcove. Typical classroom (kindergarten is larger) has a main rectangle of 768 sq. ft. plus an interior alcove of 192 sq. ft., and arrangement suitable for full class instruction but also conducive to smaller groupwork. Alcove windows, which face south, are tinted, heat-absorbing glass.



PLAN

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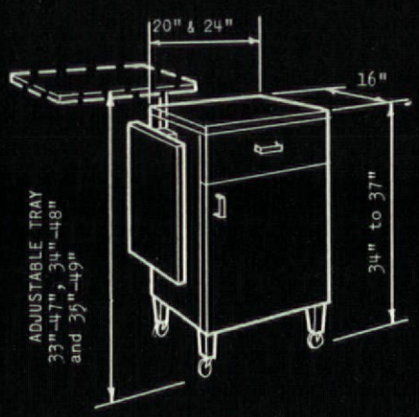
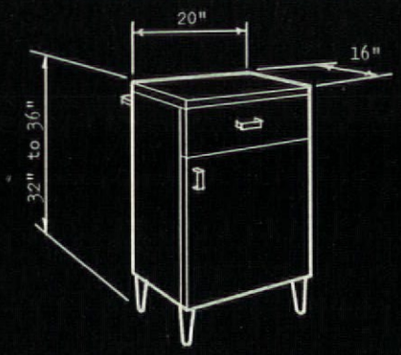
HOSPITALS—BEDROOM EQUIPMENT

BEDSIDE CABINETS



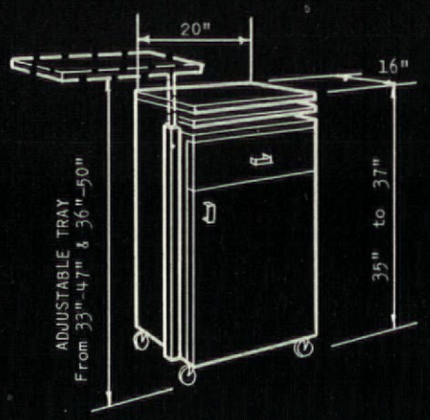
CABINET WITH SWINGING TRAY

Available with or without casters and with tray attached to right, left, or rear of cabinet. Tray mechanism built-in or attached to regular cabinet.



REGULAR CABINET

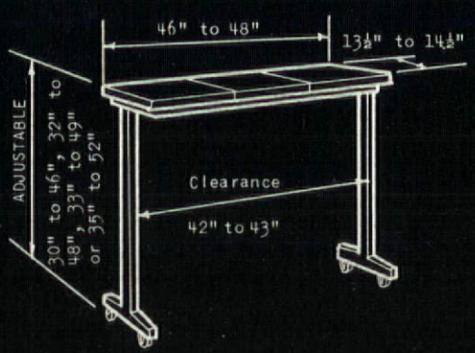
Available with right or left hand door, various open shelf and drawer arrangements, with or without casters and with or without towel bar on back of cabinet.



CABINET WITH SWINGING TRAY

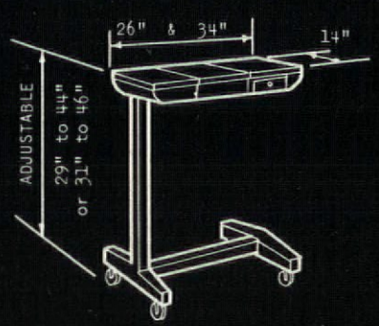
Available with tray swinging to either right or left, with or without casters. Also available with tray which slides horizontally.

OVERBED TABLES



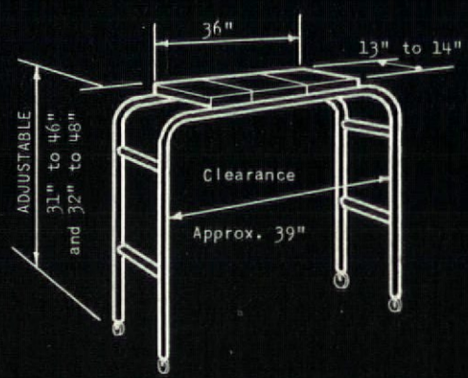
2-LEG SUPPORT OVERBED TABLE

Center lifts to form book rack and/or vanity with mirror. Height is adjustable.



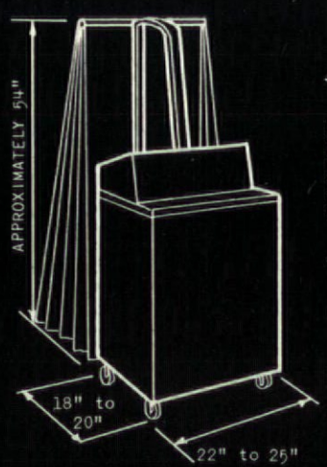
CANTILEVERED OVERBED TABLE

Center lifts or pulls out to form book rack and/or vanity with mirror. Height is adjustable.



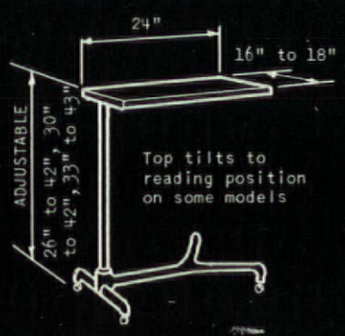
TUBULAR METAL OVERBED TABLE

Center lifts to form book rack. Height is adjustable. Available in special non-adjustable design for psychiatric use.

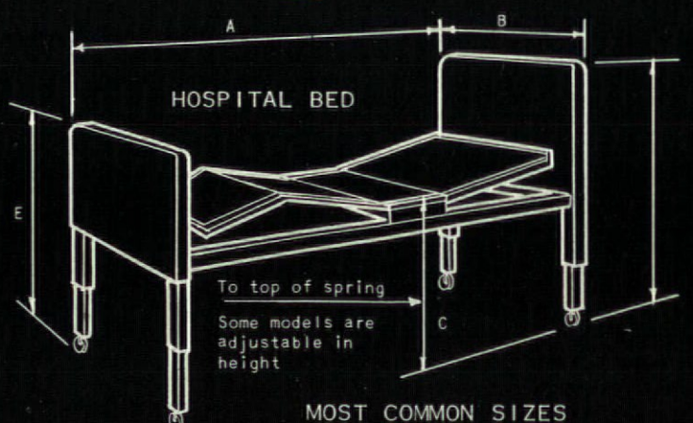


OXYGEN UNIT

Used by bed and supplied either by piped-in oxygen or a portable tank unit.

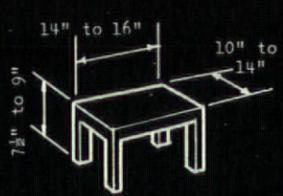


OVERBED TRAY TABLE



MOST COMMON SIZES

	A	B	C	D	E
	79"-80"	36"	27"	48"	38"
	82"-83"	36"	27"	48"-50"	38"-40"
	85"-87"	36"	27"	48"	38"
	87"	36"	Adjustable 18"-27"	48"	38"



FOOT STOOL

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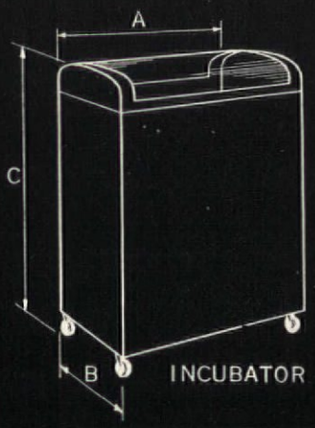
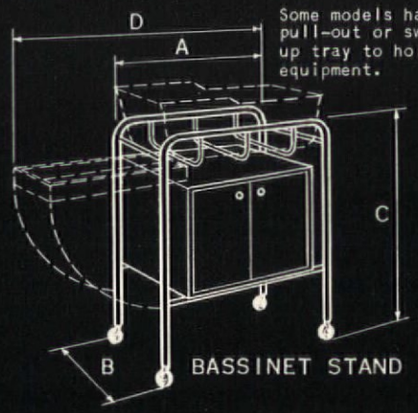
HOSPITALS—NURSERY EQUIPMENT



INCUBATOR

A	B	C
29½"	18"	46"
31"	17"	38"
31"	19½"	46"
TABLE MODEL		
16"	34"	18½"
(with stand)		46½"

Requires oxygen and electrical connections

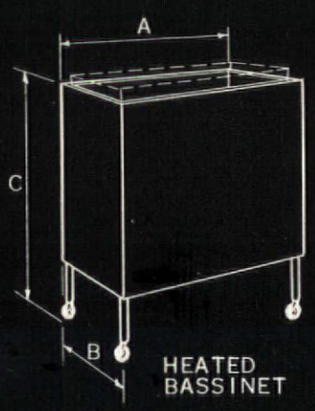


Some models have pull-out or swing-up tray to hold equipment.

BASSINET STAND

A	B	C	D
31"	15½"	37"	50"
31"	17"	33"	
32"	16"	36"	
33"	16"	34"	
33½"	17½"	32½"	
36"	16"	38"	54"

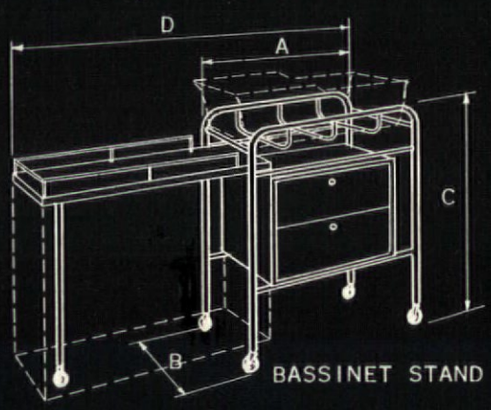
WITH OPEN SHELF, CABINET, DRAWER, OR COMBINATION STORAGE



HEATED BASSINET

A	B	C
31"	17"	30"
31"	17"	36"
31"	18"	30"
32"	18"	36"
32"	17"	44"
(+19" drawer extension added to length "A")		

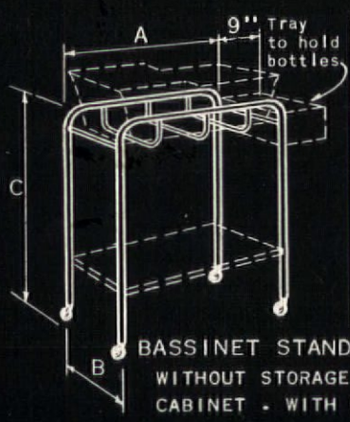
Requires electrical connections



BASSINET STAND

A	B	C	D
29"	16½"	41½"	60"
30"	16½"	41"	51"
33"	16"	34"	60"

WITH PULL-OUT DRESSING TRAY OR DRESSING TRAY AND STORAGE



BASSINET STAND
WITHOUT STORAGE DRAWER OR CABINET - WITH OR WITHOUT SHELF

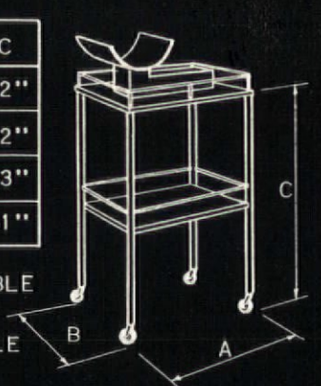
A	B	C
28"	14½"	33"
29"	14½"	36"
30"	18"	38½"
31"	17"	33"
33"	16"	34"
33½"	17½"	33"

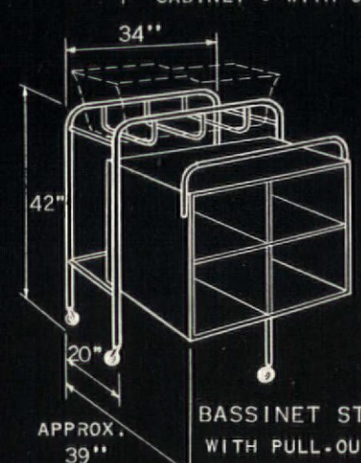
EQUIPMENT GENERAL SIZES

1. Examination Table - wide variety of sizes. 20"x 36"x 34" high is size most commonly used.
2. Linen and Blanket Hampers 18",20",22", 25" diameters. 31" to 36" high.
3. Diaper Can - 10",11", 13" diameter. About 15" high.
4. Waste Receptacle - 10" dia.
5. Instrument Sterilizer - 6"x 16"x 4" high.

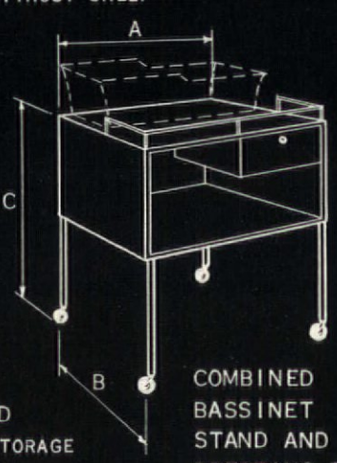
A	B	C
20"	16"	32"
21"	17"	32"
24"	16"	33"
24"	17"	31"

UTILITY TABLE WITH INFANT SCALE





BASSINET STAND
WITH PULL-OUT STORAGE AND DRESSING AREA

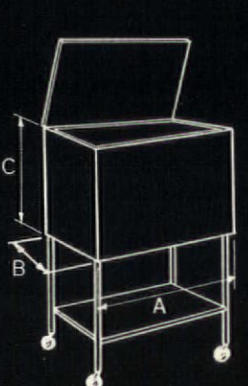


COMBINED BASSINET STAND AND DRESSING TABLE

BOTTLE WARMER		
A	B	C
22"	12"	11"
22"	15"	15"

A	B	C
* 30"	28"	47"
31" +12" drawer extension	26½"	34"

* intregal unit - no basket used



BOTTLE WARMER
TABLE MODEL OR MOUNTED ON PORTABLE LEGS

for all concerned

So much new building will be done in 1955 that it would seem as if only a malcontent could complain. This year is expected to be the building industry's ninth successive record-breaking year.

Yet if you look at the expected $39 billion total and ask how it compares with the amount we *should* build, the answer is that certain kinds of building ought to go much higher yet. Residential construction, which for this purpose means houses, will bulk to about $14 billion, a fat third; this new house production comes closest to meeting the full demand. Construction other than houses will bulk to about $25 billion, or two thirds. Counting out heavy construction, such as highways and dams, leaves some $15 or $16 billion to be spent in the industrial, commercial, institutional field—a slice of the building dollar at least equal to the house third and probably bigger.

It is in this commercial and industrial and institutional building field that production, even though it reaches a new record height, will still fall short of the demand potential; and heavy construction, which depends partly on such building, will fall short with it. The thing to think about is construction that ought to be built, not out in the grass, but along the asphalt. For we now build best and fastest out in the country, not in the city. The cities, ever since the Depression, have been starved for redevelopment.

The main reason housebuilding has been the fastest-growing branch of the building industry is the very fact that it is done out on the new land; and the new shopping centers to go with it are also in the grass; the new industrial plants are out there too; the new office buildings, even, are more and more often going into the country. The land is easier to get, planning is easier, space is more generous, circulation is possible, parking can be managed, views are pleasant, and all is rosy—at least until the moment of awakening, some time ahead in the future, when it will be discovered that schools have to be paid for, hospitals provided, city protection paid for, services installed and maintained, all in what used to be the country—and will be so no more.

Meanwhile, downtown, the streets and sewers and water supply, the electric supply and gas, the schools and police and fire departments, and all the rest have already been paid for. Yet a big part of that huge investment (which makes our existing cities account at the very least for $250 billion of our existing $437 billion real estate inventory) is being quietly jeopardized. For lack of *rebuilding*, for lack of *rehabilitation, replanning, rearrangement* in keeping with new need, our larger central cities are many of them running downhill, to become blighted commercial districts surrounded by social and racial ghettos.

The missing element in the nonhousebuilding field as a whole is the adequate, large-scale rebuilding of our existing areas downtown.

To work up an appetite for this rebuilding, architects and planners and realtors alike will have to work up an imagination for the fresh work, the more efficient operation, the sound income of the rehabilitated downtown area, the replanned, rearranged, redesigned downtown area. This will be a very different downtown area from any we can see today—if only first-class thinking is applied to it. It will be a downtown area with more of Rockefeller Center in it, more of Gramercy Park, more of Rittenhouse Square, of the Charles River bank—the grass and trees and space and circulation and parking will no longer all be out in the country; they will be found downtown, too.

To obtain all this, brainwork is what we most need, new thinking that will invent planning expedients, financing expedients, land management expedients to match the wonderful effectiveness that FHA and VA and similar inventions have brought already to the multiplication of suburban houses.

Where to begin?

Is not the biggest log in the log jam the difficulty of adequate land assemblage? In our atom age the natural operating unit downtown is at least a full block, and in larger cities several blocks; but our sliver-shaped lots, individually held, are so difficult to pull together that assembling the block for the Socony Vacuum building (p. 86) is said to have taken 60 years.

The handicap of small individual holdings is cumulative, for it not only makes difficult the assemblage of adequate sites, it also makes difficult the wider, more sweeping, more generous handling of open space that the genuinely modern city needs for traffic and for plain "breathing."

In such a situation, the passage in 1949 of Title I, the urban redevelopment title, gave us a first major new expedient. Gradually our planners, our big lending institutions, our architects, the business leaders of our communities, are learning to use this first tool with insight and imagination.

As we go to press a group in Detroit composed of automotive industry leaders, labor leaders, business leaders, and imaginative architects seems to be putting through a large apartment "redevelopment" which, in the words of Architects Oskar Stonorov, Minoru Yamasaki and Victor Gruen, will let the expressways lead *into* the city as well as *out* of it, bringing people to new homes and new places of work inside.

Many more new expedients will be needed to accomplish for commercial and institutional building what FHA and easy financing have accomplished for residential.

In dealing with rehabilitation, the ACTION committee naturally enough spoke first of our "housing inventory" as an enormous national asset to be preserved; but let us remember that slums and blight grow just as fast in run-down warehouse districts, run-down commercial districts, semi-abandoned downtown industrial or rail terminal districts. As we learn to make our land fluidly available again downtown, it will bring not only a handsome and agreeable new central residential section along with a shopping section, an office building section filled with fine new buildings—it will also carry a new flood of heavy construction with it: the new through-expressways, the parking facilities, streets, rapid transit ways, arcadings, moving pedestrian conveyors, that must go along with the buildings. This work will vastly increase profitable building construction, making our 1955 figure of $25 billion look small.

America's big spurt of homebuilding has not been an automatic consequence—it has been the result of much thought and organization; the same degree of imagination applied to our cities downtown will make them, too, blossom.

Douglas Haskell

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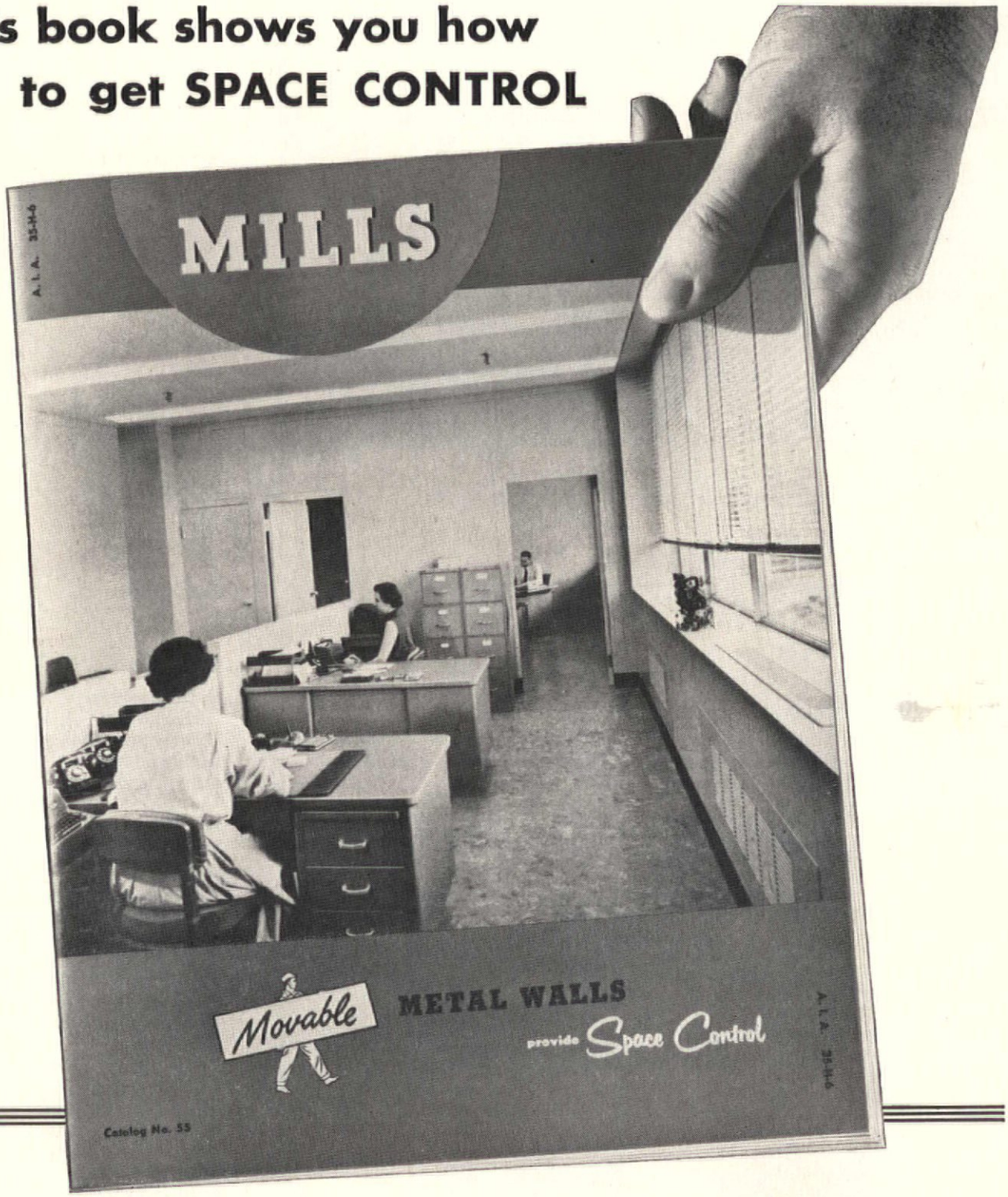

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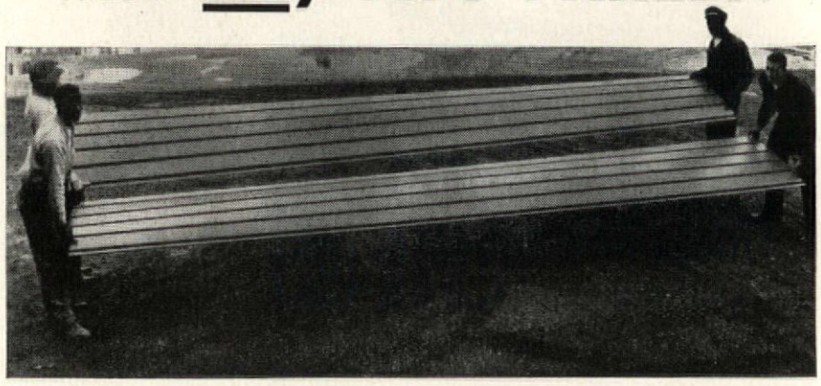

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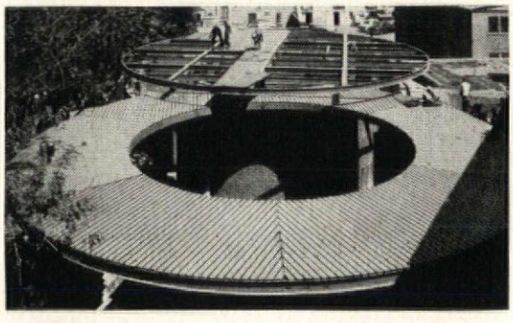

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ROUND TABLE

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ing. If an architect is not perfectly trained in a technical way, this is not a very important fault, as it is for a doctor, for instance. If a doctor is not technically trained, he can kill a man, perhaps even two or three; but if an architect is not morally trained, I think he can kill not only one man but a whole society. In the moral field I think we have to give the student the sense of responsibility toward society first of all, and toward himself as an artist. I think that these two responsibilities have to be established as the basis of architectural education.

SHAW: The responsibilities of an architect are both technical and social and require courage and experience. The graduate coming into the world of reality is going to have to understand the purpose of his building—not only the purpose as a function, but its purpose to society—the feeling of depression or elevation it gives to people when they go into it. It's a tough job to produce that kind of a fellow. The question is not how much money the architect will make. He'll make enough money if he solves the problems of the world, if he has the sense of responsibility to do it. One method is to have, during these school years or in those graduate years, personalities who have been successful in a large way, not necessarily architects, come and talk to the fellows. I think of Bill Zeckendorf, and there are a lot of Zeckendorfs. There are a lot of Ernie Grahams and Albert Kahns, who could and would be a means of giving an extra orientation to students. You may be able to expose the students to a general in the Corps of Engineers. That kind of person has a great impact on America in general and it's this responsibility that makes American culture turn to the architect.

SMITH: We need something more than good designers, though we have to begin with good designers, because the effectiveness of good design depends on an environment in society that recognizes it. People are not going to insist on good design until there is a general public understanding of what good design really is, and the architect, I believe, is only going to achieve that through achieving a responsible position in the community. I hope that someday beauty and decency of living are accepted as a necessary part of life and require practitioners to put them into effect. I think responsibility is the key to the whole thing.

ALEXANDER: Everyone has been talking about a school of architecture under the delusion that it trains people to have something to do with buildings. As a matter of fact, surveys made in the thirties found that only about 30% of the graduates of this architectural school were engaged in architecture or any calling that had any relation to building. Perhaps the concepts of the profession should be as broad as saying that architecture is the profession of creative thought. I think that has a bearing on the Princeton ideal of the education of the architect, that the fellow who comes to architectural school is going to get a training which will fit him to do a lot of things besides designing buildings. I know the profession turns its back

continued on p. 155

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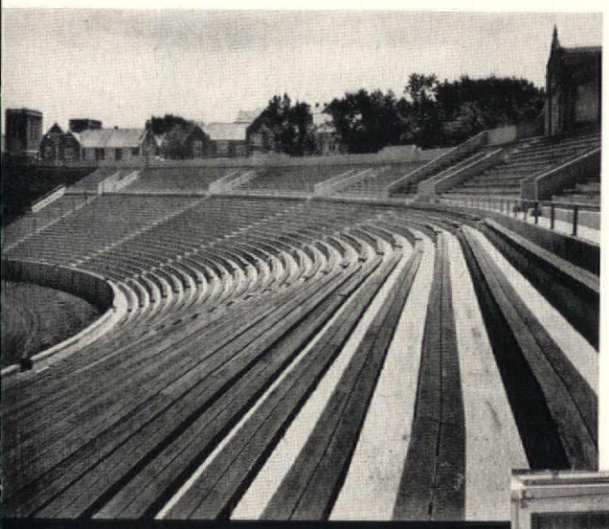

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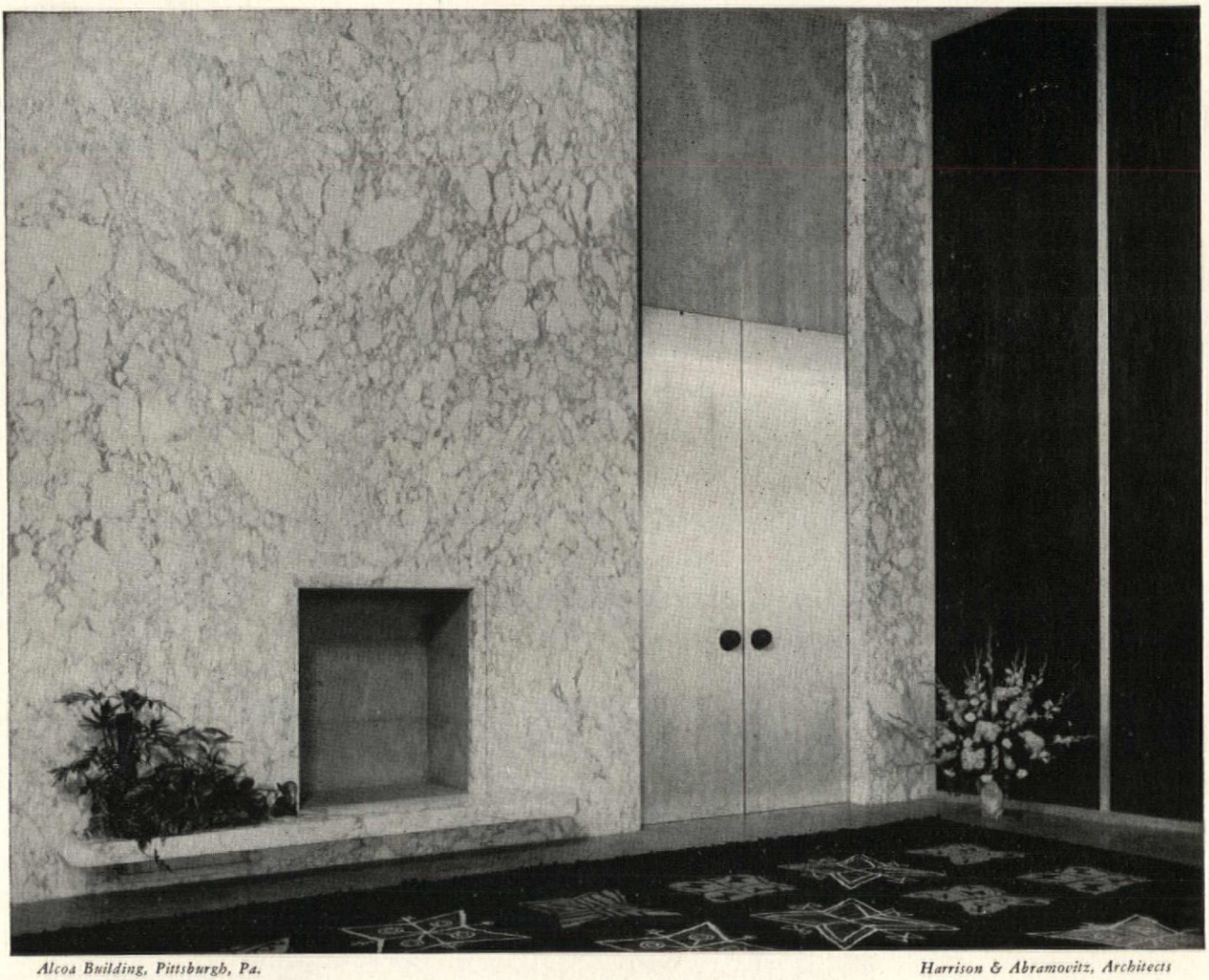

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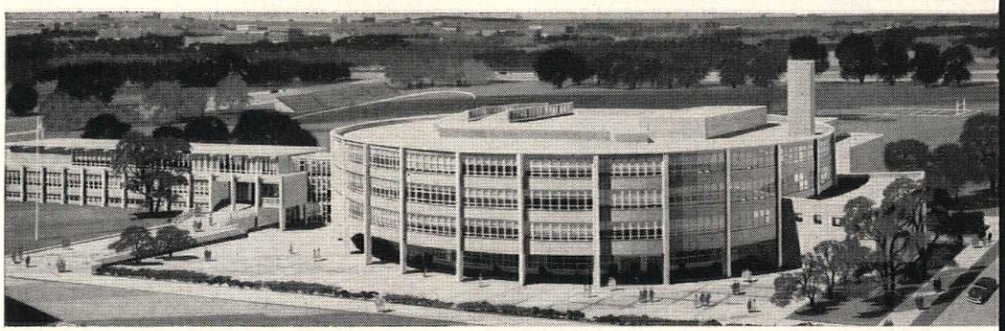

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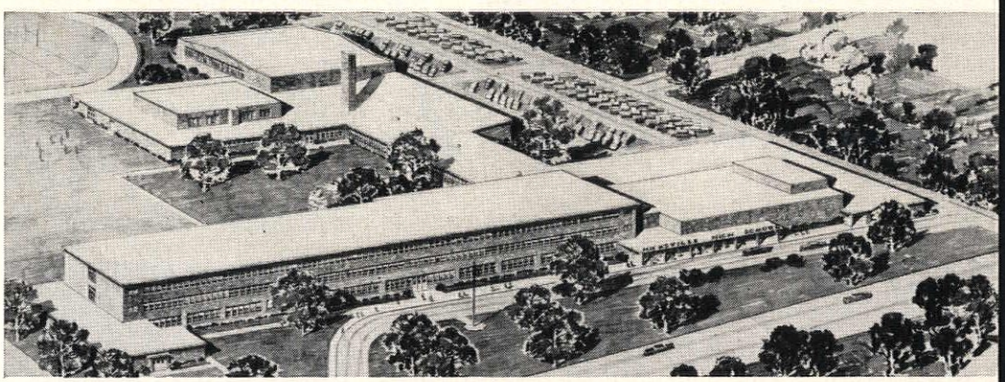

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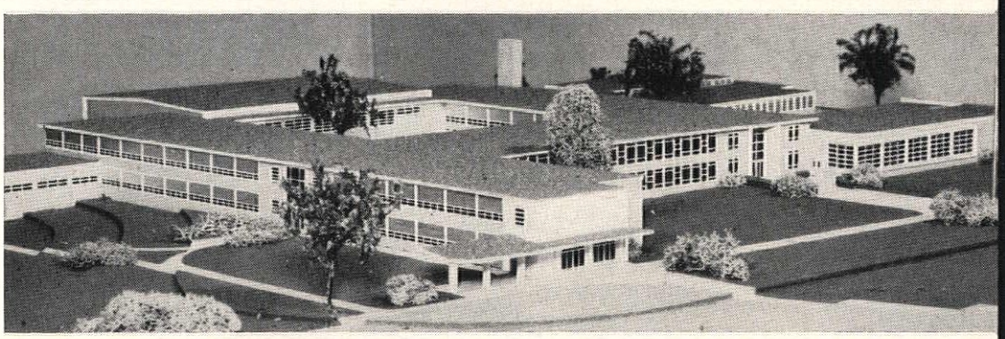

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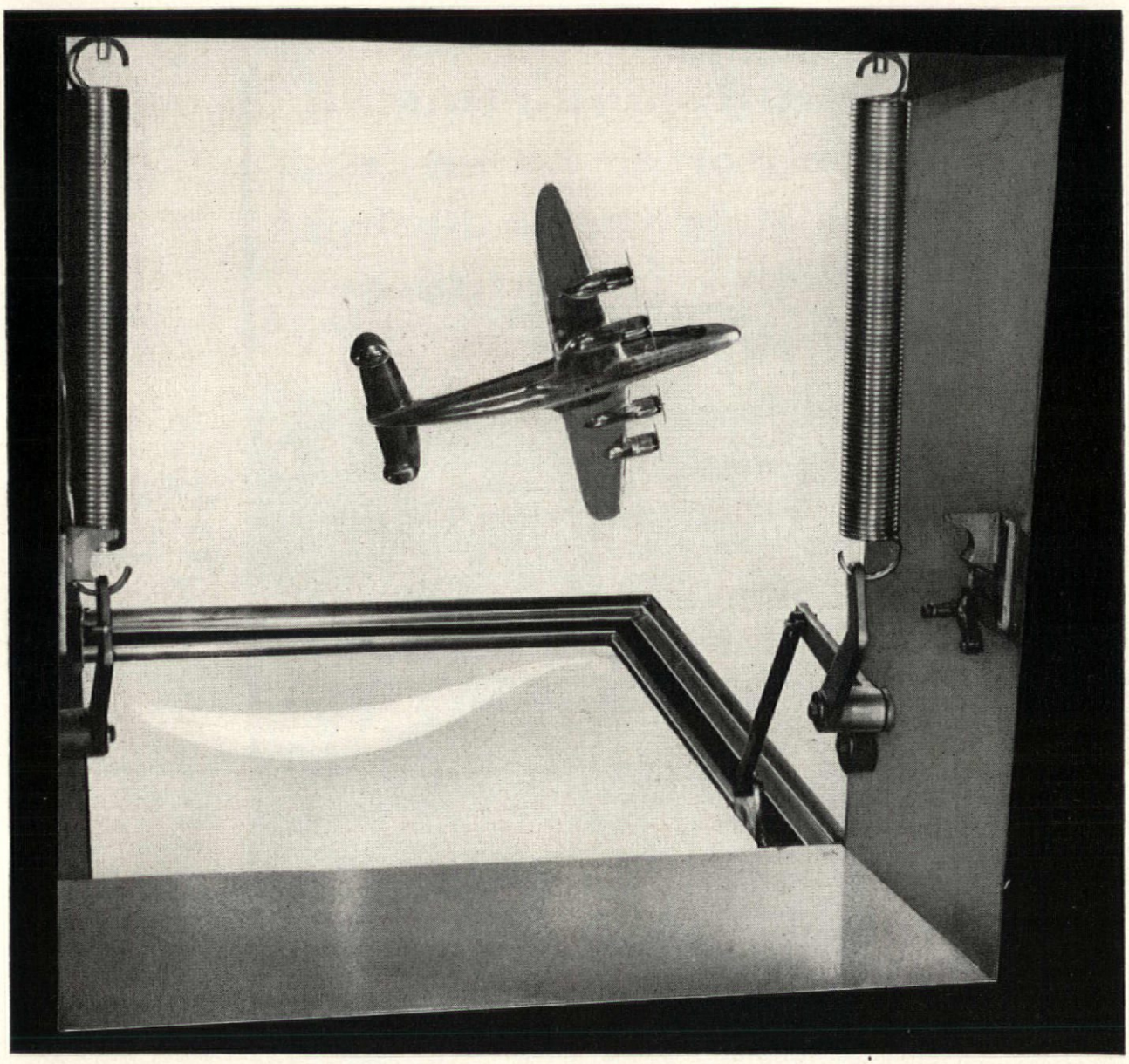

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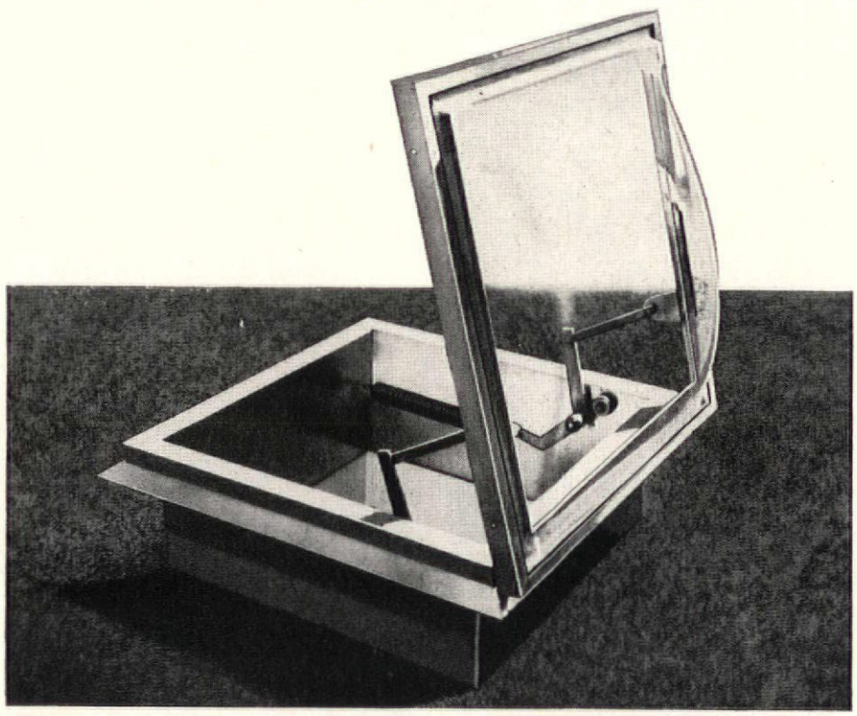

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ROUND TABLE

Continued from p. 150

on Charlie Luckman when he starts to sell soap. We should be proud to own him under those conditions. A lawyer, when he goes into law school, perhaps nine times out of ten does not expect to practice law as a professional. He expects to be president of General Motors. I think a student entering architecture should have a very broad vista of the profession.

ABRAMOVITZ: The architect's mission should be to place the best of society or the desired society in an organized pleasing form. And a school should develop talents and tools in that direction.

SERT: With all due respect to architectural magazines, I think people look much more at architectural magazines than at what is happening across the street. They need to learn to look at things. A whole lot of young architectural students think a building has to start by being an interesting structure. I don't think that is the role of the architect. I believe a building has to be an appropriate structure, but working out the type of structure is the engineer's work, and the architect should not try to replace the engineer on the job. That is damaging, because these young people are sidetracked and are unable to apply ordinary structural methods. Engineering is all well and right, and it should be known by the architect.

WURSTER: Style is overstressed. We overstress it in our magazines and everywhere else, so that the student is apt to think it is important. I would plead for digging back to the fundamentals of what the thing is, of what you are observing. This is one of the important things that the instructors have to bring to a student's attention so that he can really become involved in architecture itself.

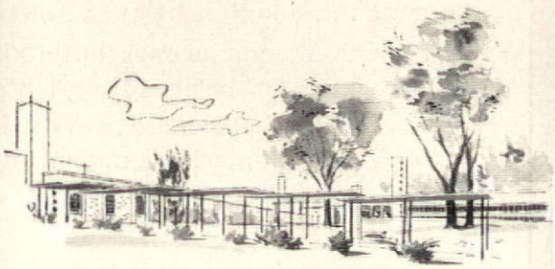
SMITH: I think it's extremely important that the broad aspects of all of the things that go into a building to make a complete assembly are touched on in the course of education, so that the student understands something about the assembly—the significance of the assembly.

KAHN: We are constantly confusing design and order. Order includes all the designs of construction—mechanical and spiritual; and design is merely the process of fitting them into conditions and coming up with a certain experience which strengthens and even enriches the order.

BUNSHAFT: There is one thing that has been left out of this discussion of design. The professionals are disappearing as economics take hold. That is an expression of our times. I think that most architects themselves aren't facing the problem properly and therefore are losing much of the work that should be done. I hope the next generation who will have this balance of engineering, economics and technical know-how will turn out an architecture that is representative of our times and that, I believe, will be based to a degree on economics. I think, too, it will be good architecture. Still there is no mention of how to handle that in school, or whether it should be handled in school.

continued on p. 159

Echoes are absorbed by the Armstrong Travertone ceiling in this beautifully designed, two-story lobby. Travertone's attractive white fissured finish blends ideally with the handsome combination of buff colored brick walls and beige terrazzo floor.



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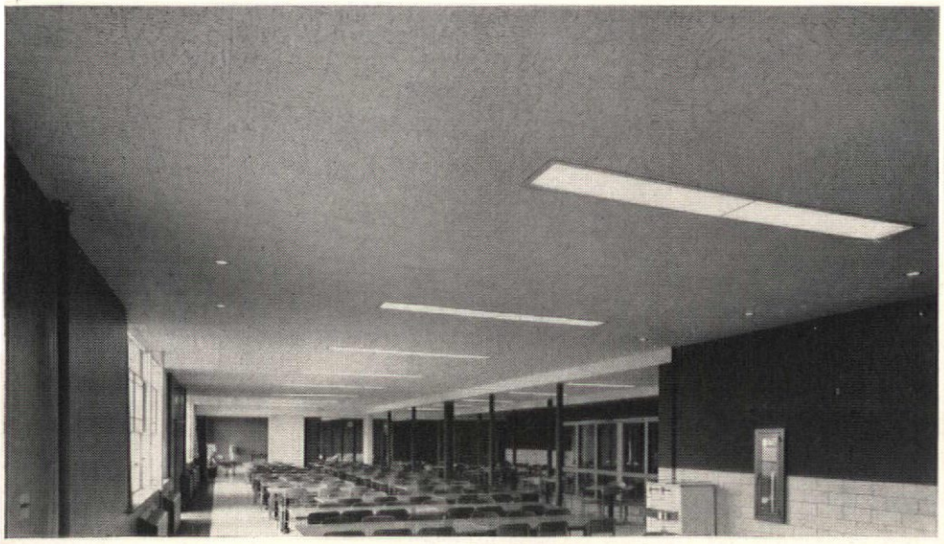
Discussions are free from distracting noise in this tastefully designed seminar room. The quiet, handsome Travertone ceiling muffles the sound of footfalls, scraping chairs, and cuts down voice echo.



Quick, easy maintenance helps keep this cafeteria ceiling of Armstrong Travertone within the school's rigid standards of sanitation. Armstrong Travertone can be cleaned by vacuuming or washing with mild soap and water.

High light reflection from the acoustical ceiling in this classroom is due to Cushiontone's factory-painted white finish which reflects 79% of the light that strikes it. Cushiontone can be repainted without lowering its acoustical efficiency.

Sound conditioning helps college plan for future

Expansibility is a key design feature of the Administration-Library building at Bellarmine College. The new building's chapel-auditorium area can be converted to classrooms as soon as funds permit a separate chapel at the growing four-year-old school. The change will be simple because the architect provided all areas of this well-planned structure with forward-looking installations of the basic elements—including highly important sound conditioning.

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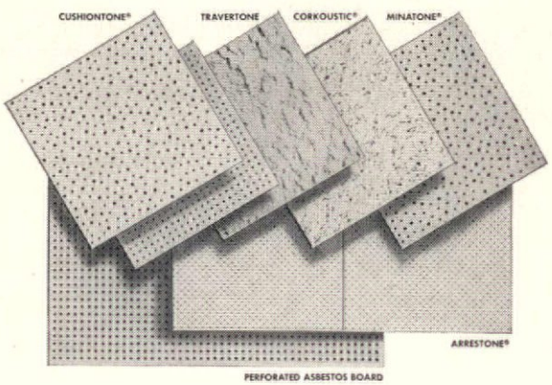

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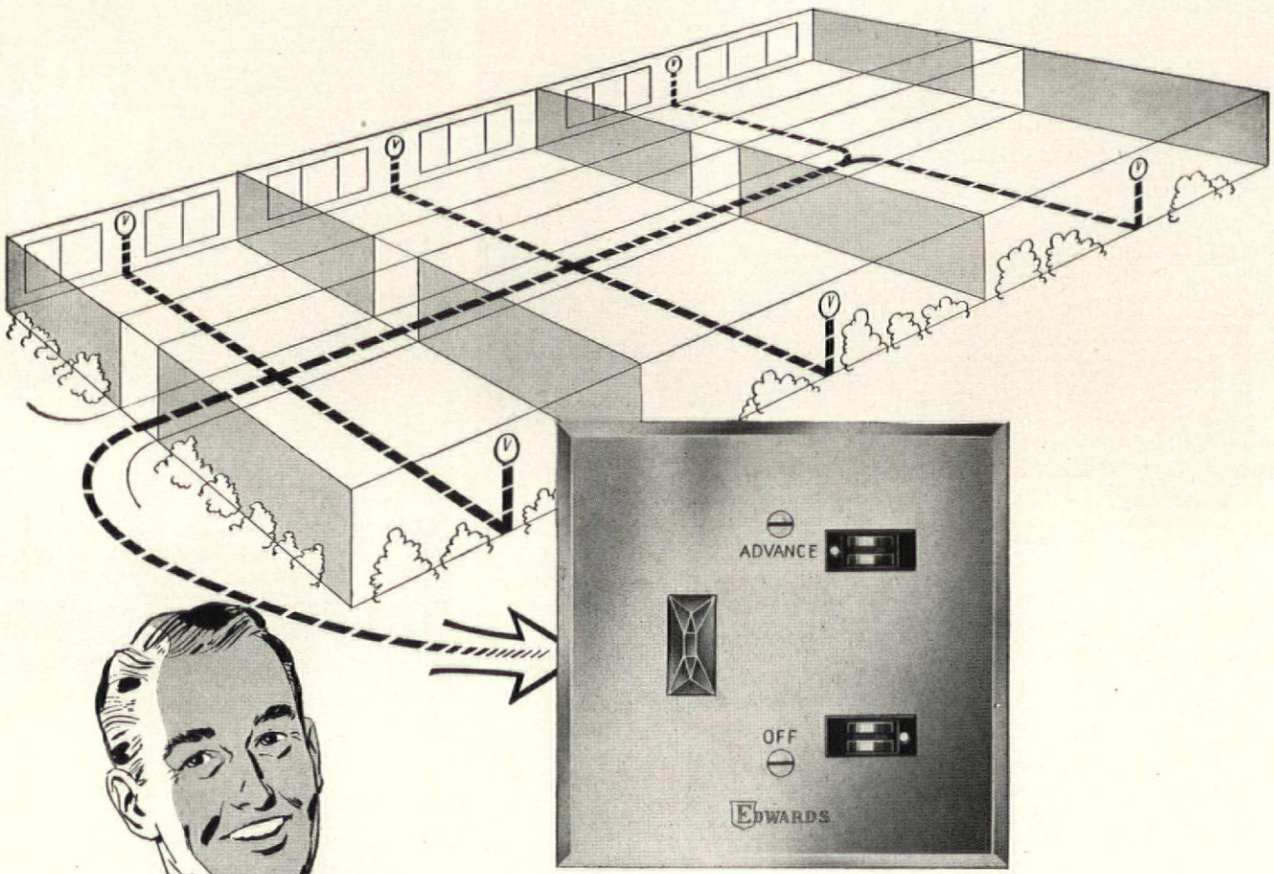

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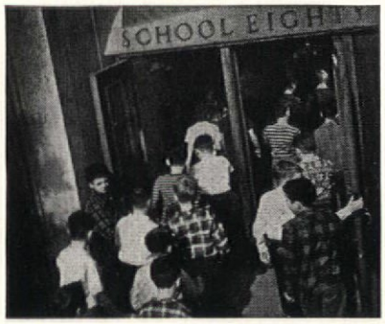

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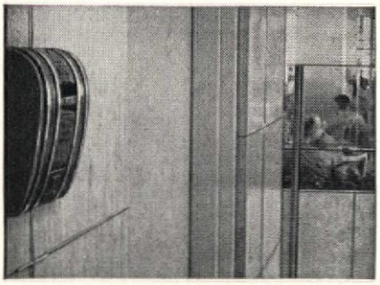

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ROUND TABLE

Continued from p. 155

SMITH: You are saying that the practice of economic restraints tends to produce a good design.

ALEXANDER: I have a different point of view on this matter of cost. I believe it is important to be able to control cost. But I think it's so much *more* important for the architect to so inspire his client with a concept of the better things in life that the budget is determined by his desires and appetites as well as inspired and whetted by the profession.

BUNSHAFT: I don't agree. I think that we as a profession are an obsolete device in this country. It's due to the fact that we are fighting as architects to do something which costs more than if an engineer were doing the same thing. This, of course, is only one factor.

KAHN: The cost is one minor factor. I believe in the appropriateness of structure—don't try to shoot the works at a structure. Understanding how far to go to make a building of good character as a piece of architecture is all the control you need.

ABROMOVITZ: I think we are kidding ourselves when we tell anyone that you can do a good building just as cheaply as a poor one.

SHAW: You can do it on an industrial building, but that's all.

ALEXANDER: I was misunderstood. The profession has an obligation to the public to be able to predict within pretty accurate and reasonable limits what the cost of a structure is going to be. The ability to stay within cost limits once they are established is certainly a professional obligation, but to raise the standard is our major obligation.

SERT: Once the architects were giving the public something the engineers weren't giving them. The public was paying for that in the early centuries, there is no doubt, but now we have moved to another extreme and we call our business functional. What the architect should do is show he is capable of planning the building technically and effectively and as cheaply as the engineer, and that, besides, he can add something to those bones that the engineer puts there, which will make for greater satisfaction and for better living. The majority of people would react in favor of that.

BUNSHAFT: I just want to correct the impression I gave about economics. Everybody seems to jump to the conclusion that I meant the lowest cost. I meant by economics that we should show a client that money is well spent; that may involve a very expensive issue. You have to show him through the effect of public relations and maintenance and such things that he is getting a good investment. I don't mean to build the cheapest thing, but the soundest, from a broad, economic point of view.

HASKELL: Architectural education must center largely on strategy for architecture. It could replace a good many courses of today. For example, you now study the nature of materials, but there does not exist to my

continued on p. 166

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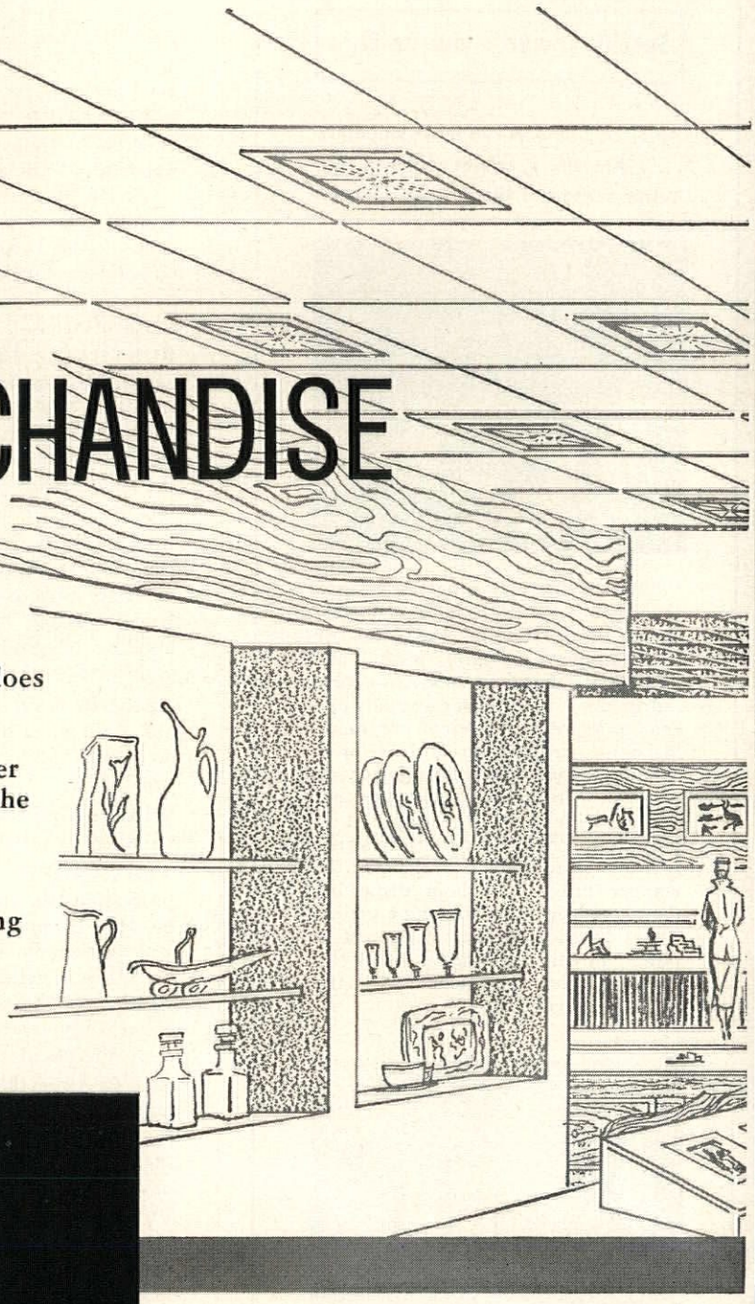

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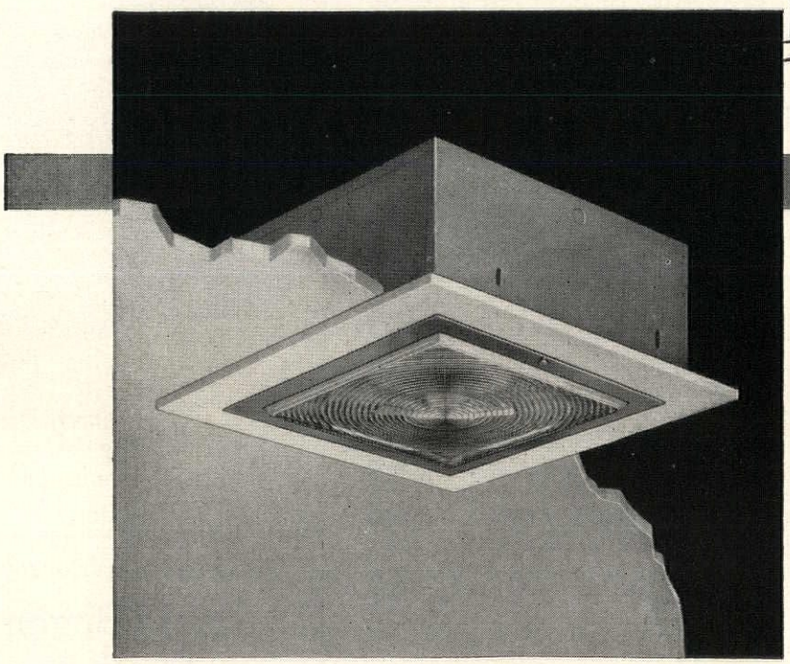
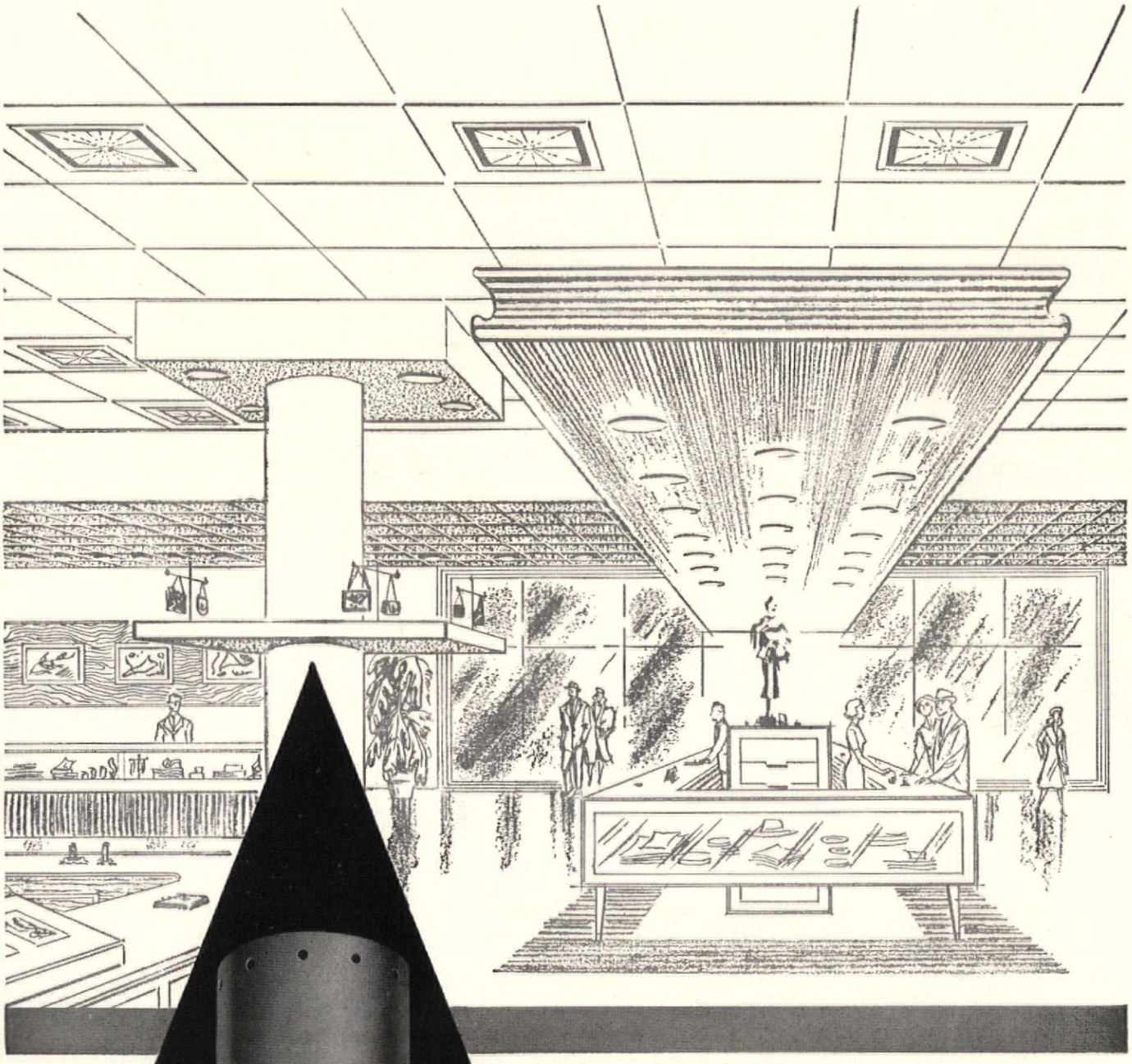
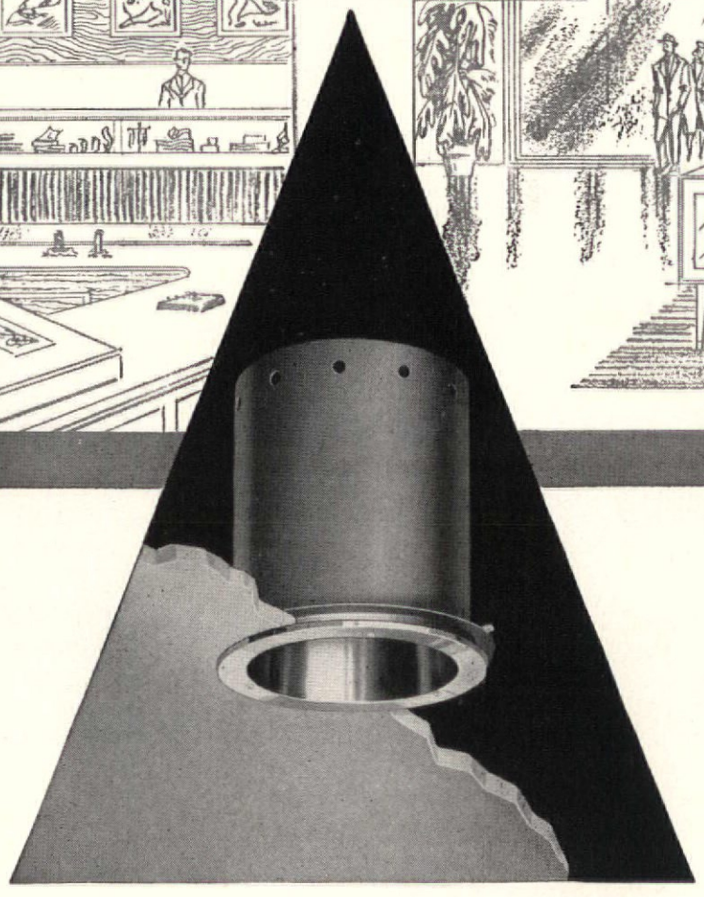


ELIPTISQUARE

Merchandise lighted with ELIPTISQUARE'S clear, prismatic Amcolens reflects its true color value. For general area lighting, advanced ELIPTISQUARE recessed and surface units provide highest light transmission efficiency.





ELIPTICONE

For the optimum in accent lighting, ELIPTICONE delivers the unusual in shielded, recessed and surface illumination. Complete absence of brightness, from any normal viewing position, on the visible surface of ELIPTICONE, creates a dramatic unawareness of the light source.

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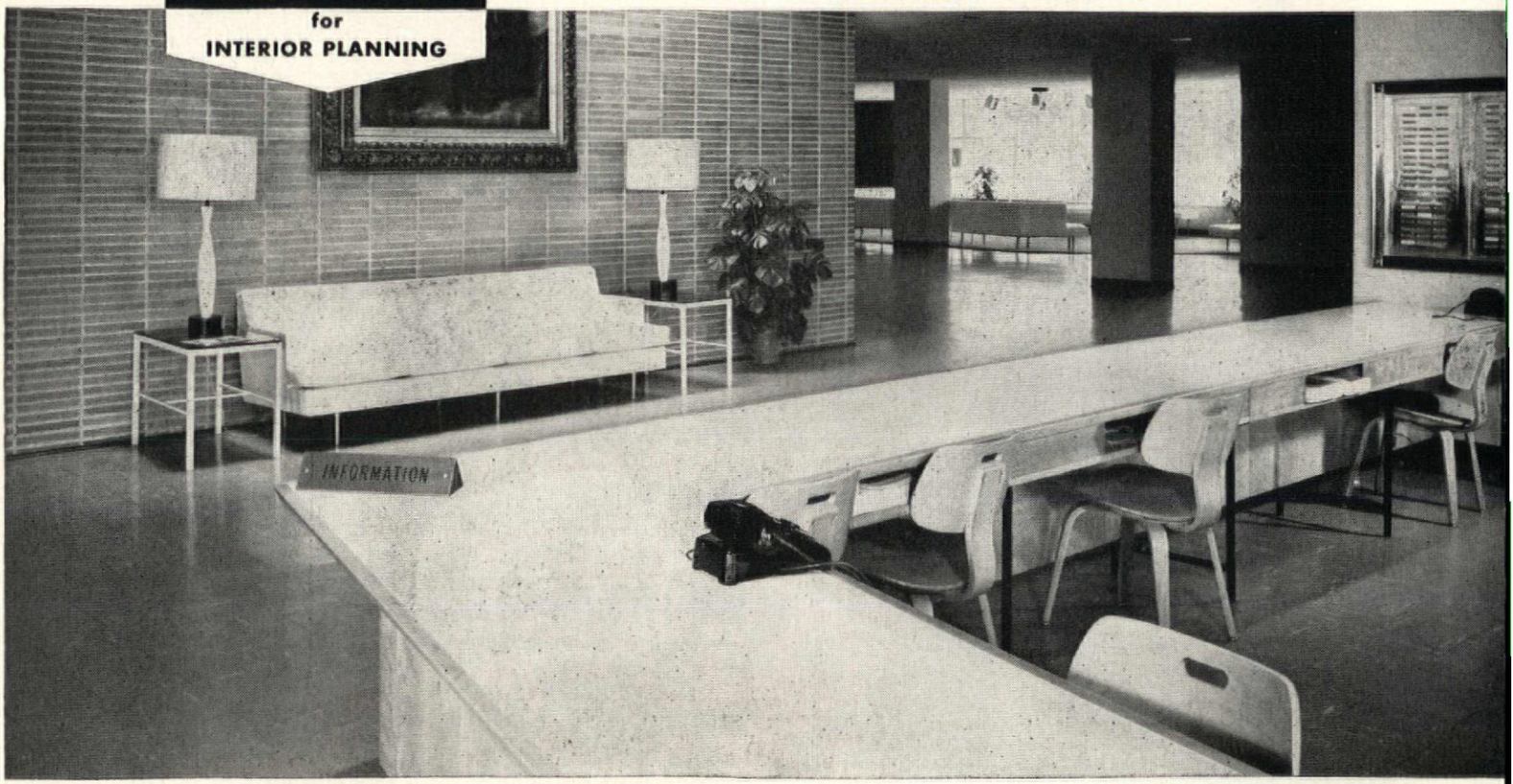

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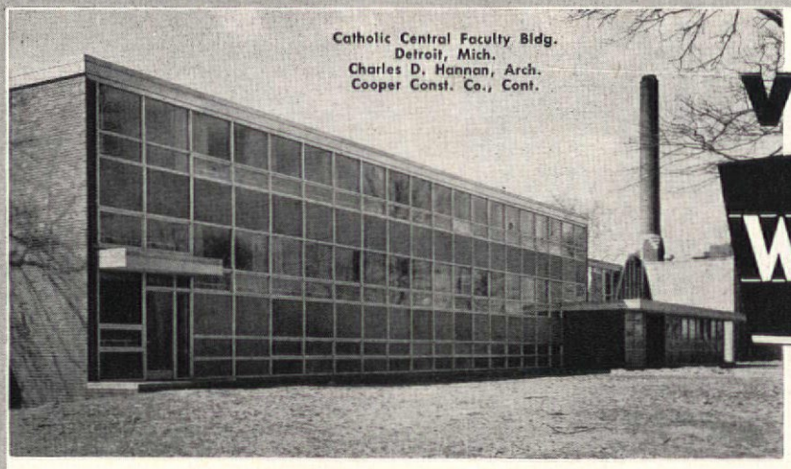
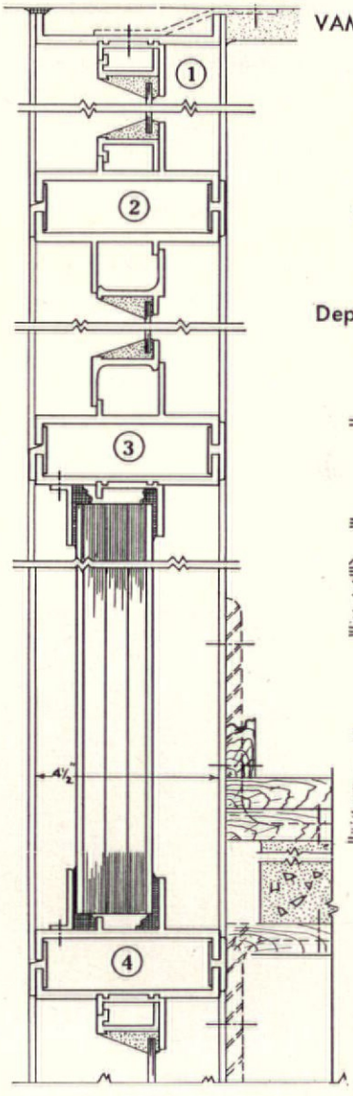
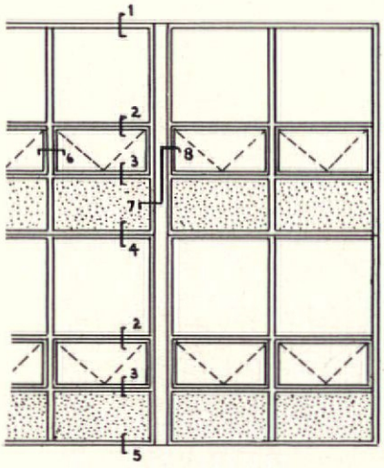
AF-1-55

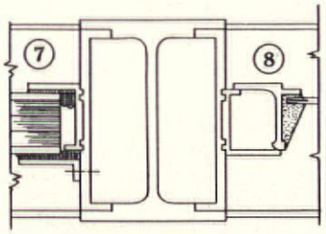


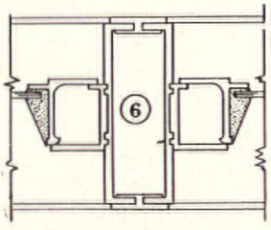
VAMPCO WINDOW WALL

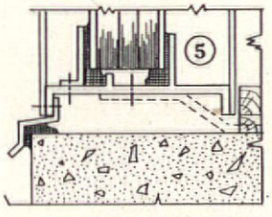
An outstanding example of VAMPCO'S Heavy Ribbon section Window Wall! Charles D. Hannan, the architect, chose this type of construction for the beautiful Catholic Central Faculty Building in Detroit, Michigan. This is only one of the many modern installations of VAMPCO WINDOW WALL under construction at the present time. This type of section can be adapted to your individual design. Our Engineering Department is available to you for further information. VAMPCO Windows are in Sweet's File or you may write Dept. AF-15 for particulars.











VAMPCO

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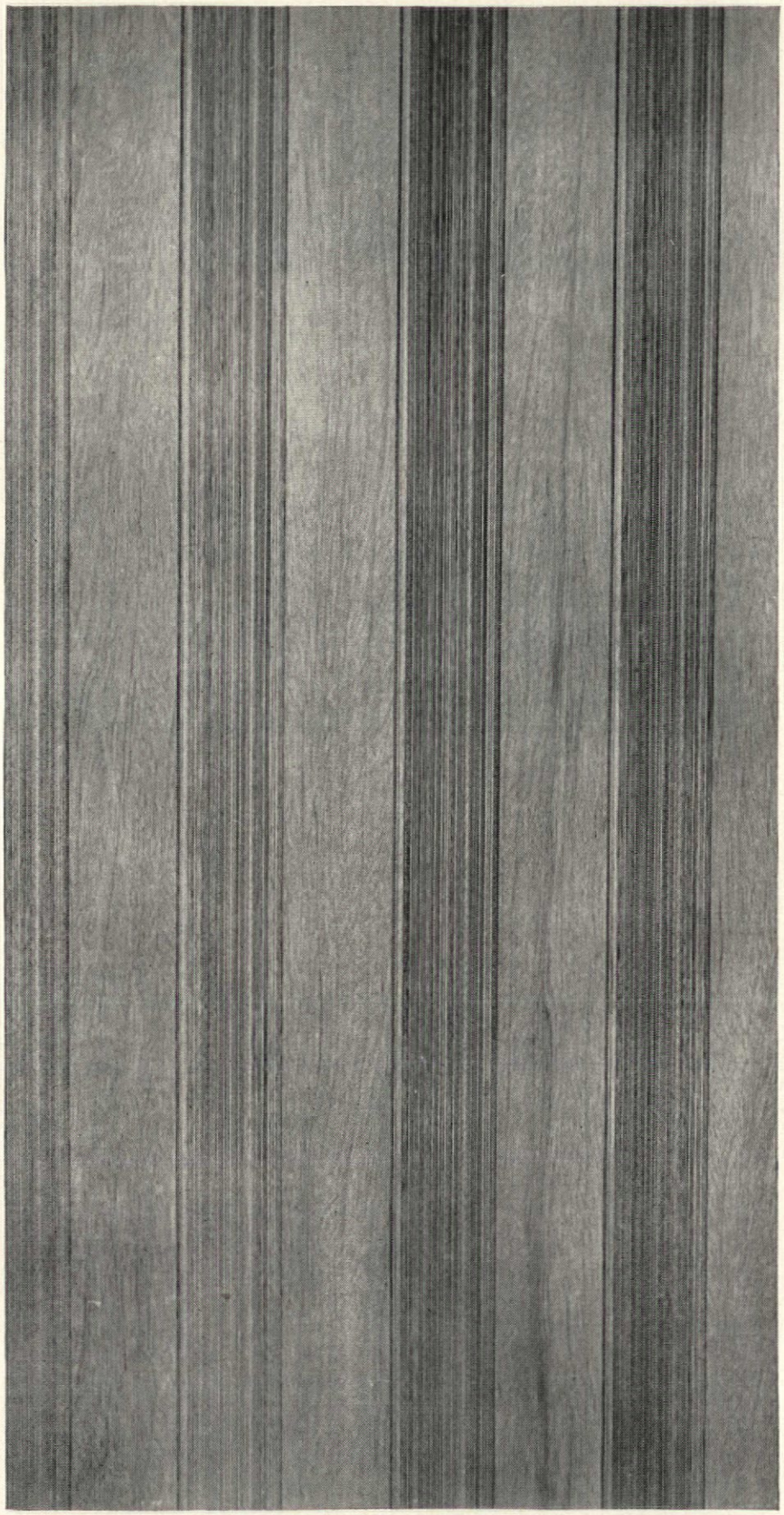
Two new hardwood panels point up trend toward



PLANKTEX is a strikingly decorative textured wall paneling for both residential and institutional use. Can be finished natural or stained.

Two beautiful new panels—V-Plank Weldwood and Planktex—join the growing United States Plywood family of pre-finished paneling.

Take a good look—and another—at two of the very newest ideas in hardwood paneling. Both of these beautiful Weldwood panels feature today's most-talked-about trend in interior paneling . . . the *textured* look.

And both are available with Weldwood factory-applied finishes—the finest plywood pre-finishes ever offered. Applied by skilled craftsmen with years of wood-finishing experience, Weldwood pre-finishes actually cost less than on-the-job finishes!

V-Plank Weldwood comes in 4′ x 8′ x ¼″ thick panels that are vee-grooved vertically with the grain of the wood. Groove-spacing gives effect of random wall paneling. Beveled vertical edges hide butted panel seams. V-Plank is available in a complete range of light to dark woods: Walnut, Korina®, Honduras Mahogany, Samara® and Oak. All are completely pre-finished—even to wax.

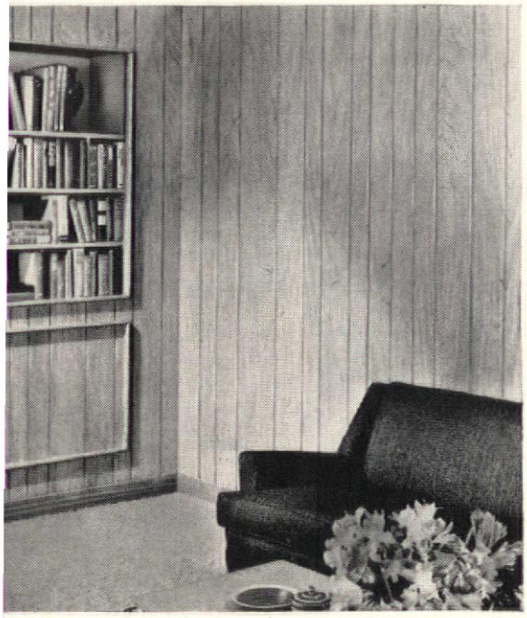
Weldwood Planktex 4′ x 8′ x ¼″ thick panels have 6-inch bands of irregular striations alternating with 6-inch bands of smooth wood. Striations hide butted panel joints. Made of finely grained, inexpensive Philippine Mahogany, Planktex is available unfinished or pre-finished.

Both V-Plank Weldwood and Planktex can be installed without nails using new Weldwood Contact Cement. Or if nails are used with Planktex, matching Weldwood Mahogany moldings are available to simplify installation.

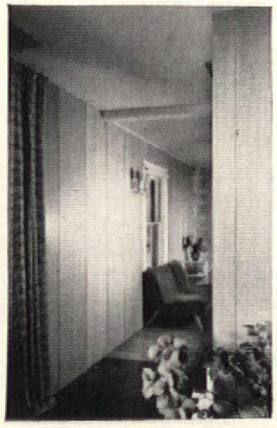
Guaranteed for life. Like all Weldwood paneling, both V-Plank and Planktex are *guaranteed for the life* of the building in which they are installed!

STRIATIONS IN PLANKTEX contrast vividly with alternating stripes of smooth surfaced wood. Each sheet has 4 bands of striations and 4 bands of smooth wood.

textured look



V-PLANK ADDS a note of textured wall interest to a room with a distinctly modern flavor. Shadow line of grooves adds to apparent height of room.



PRE-FINISHED PLANK-WELD† has an attractive plank effect, too! Narrow 16¼″ wide by 8′ high panels add wall interest—and there are no nail holes to putty! Panels overlap to conceal nailed clips holding panels in place. Plankweld comes in six fine woods: Birch, Oak, Korina, Honduras and Philippine Mahogany and Walnut—all with expert, Weldwood factory-applied finishes.

†Reg. and Pat. Pending

GROOVES IN V-PLANK WELDWOOD are spaced like this to give a random paneling effect: 6″, 4″, 6″; 9″, 7″; 4″, 8″ and 4″. Note that a groove occurs every 16″, hiding nails when the material is nailed to studs.

SEND COUPON for complete details on these and other Weldwood hardwood panels such as Plankweld, or visit any of the 73 United States Plywood or U.S.-Mengel Plywoods showrooms in principal cities.

Weldwood®

V-PLANK* and PLANKTEX*

Products of

UNITED STATES PLYWOOD CORPORATION

World's Largest Plywood Organization

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UNITED STATES PLYWOOD CORPORATION
Weldwood Building
55 West 44th Street, New York 36, New York

I'd like to know more about V-Plank and Planktex ( ) Plankweld ( ) other Weldwood hardwood paneling ( ). Please send me complete details. AF-1-55

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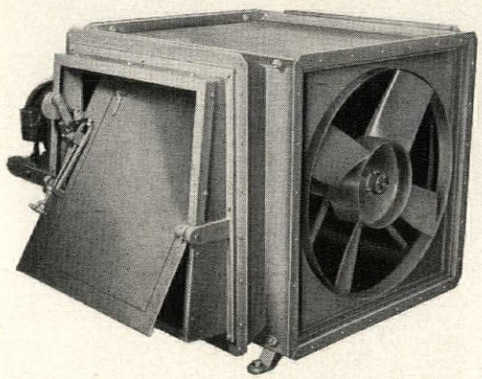
CITY.....STATE.....



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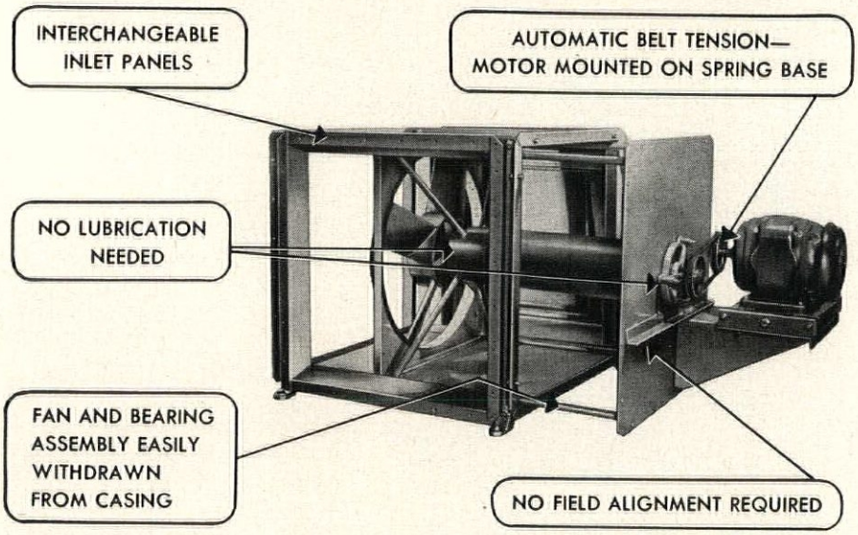

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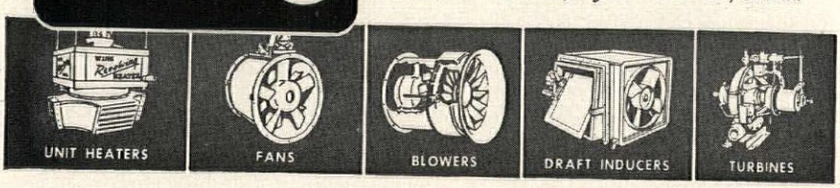


ROUND TABLE

Continued from p. 159

knowledge in any part of the country a study of how materials and equipment are produced, designed and distributed. There is little critical study of who builds buildings of different kinds, for what purposes and by what financing procedures. I don't think the designer misses his opportunity primarily because there are so few good designers. He misses it because the good designers are shoved aside by real estate men and others, and then put on a board of design just to isolate them from the project.

We have a new homebuilding industry since the world war. It's in the hands of men who have graduated from business schools, technical institutes and high schools. They are in command of techniques which I don't think one architect in 2,000 understands—techniques dealing with market demand for a market product, which is sold to buyers in masses; techniques of producing that product, techniques of financing and distributing it. And there is great scorn in great sectors of our profession for these people, their product and everything to do with them. *We* are still studying about architecture's past problems, but the problems these boys will meet tomorrow will involve the mass production of houses and the speculative financing of large groups of buildings, including speculative office buildings, apartments, factories, perhaps even schools!

PERESSUTTI: If an architect feels really responsible on a moral level to his profession, he will become such a good technician that perhaps he will design a house for less money than even an engineer could. If he excels in a technical way only, he is not an architect any more. He is out of society. It seems to me that this responsibility which he has toward society—society is his client—is most important. If he feels really responsible, he will learn what society needs. So I don't think that it's a contest between two points of view; one follows the other.

STUBBINS: If the student can really feel that way about his profession, he will become a master of it. I've always had the belief that there were four criteria in architecture that really cannot be separated and one cannot be said to be more important than the other—in a way they summarize what Abramowitz and other people have said: 1. I think a building must be logical structurally. This does not mean that the architect has to be an engineer, but at least he should have a sense of structure and a sense of order for integrating the mechanical system and everything that goes into the making of the building.

2. The plan must work and the building must perform well the purpose for which it is built.

3. The whole must be esthetically pleasing. I do not believe that this comes autotically, as there are many choices and many different solutions to a single problem.

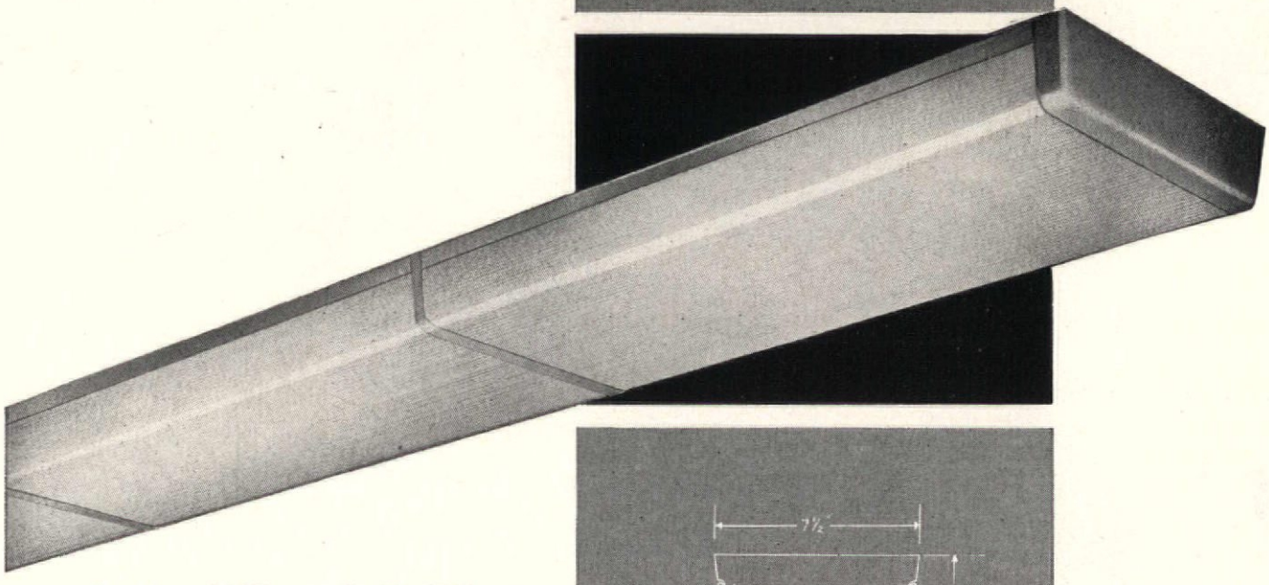
4. It must be economically feasible.

It must be, in form, an expression of all these things. I cannot say that esthetics are more important than structure, or plan is more important than economics. They all go hand in hand.

now...

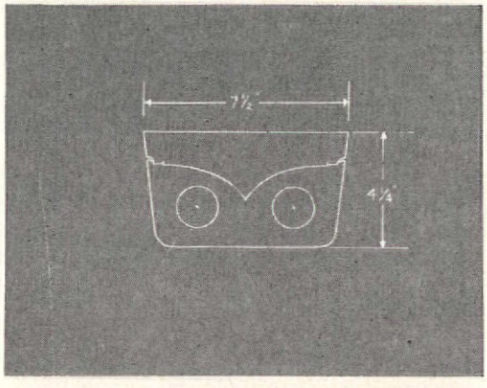
sightron

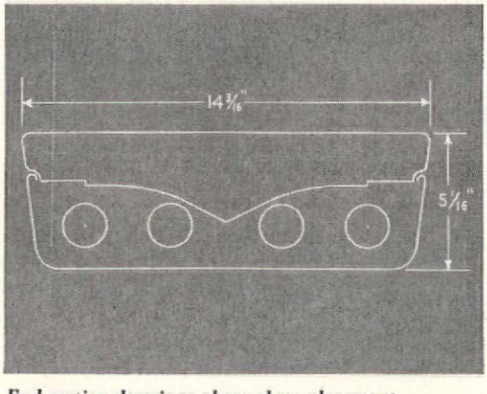
in four and two light versions



fully diffused lighting ...trim, crisp design

Our highly efficient Sightron series is now available in a new four light version. Both four and two light fixtures offer trim, unobtrusive design that maintains the architectural integrity of any area. Both now have concealed hinges at side of diffuser to make maintenance simple, and both now have rapid start ballasts to produce instantaneous lighting. Ribbed plastic diffusers give an even glow of fully filtered light without shadows. May be used individually or in continuous runs. Quickly and easily installed. Ends are white enamel. Accessory pieces to match.





End section drawings above show placement of lamps in two light (top) and four light versions of Sightron fixtures.

Write today for free brochure of architectural lighting by Lightolier.

Lighting by **LIGHTOLIER**

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AMONG SEVERAL REASONS IS THIS IMPORTANT ONE: a Yorkaire System is the *right kind* of air conditioning . . . custom-tailored to the building.

That's why you'll find York cooling in 27 of Miami Beach's largest, best hotels (not to mention the leading hotels in Miami proper). As in all large buildings, glass areas and heat loads and floor areas and numbers of rooms, economic considerations, taxes, depreciation and many other factors varied from hotel to hotel, up and down the Beach. So obviously no one system—or even two or three—could do the job best for every hotel. That's why York engineered each system to fit the particular hotel in which it is installed.

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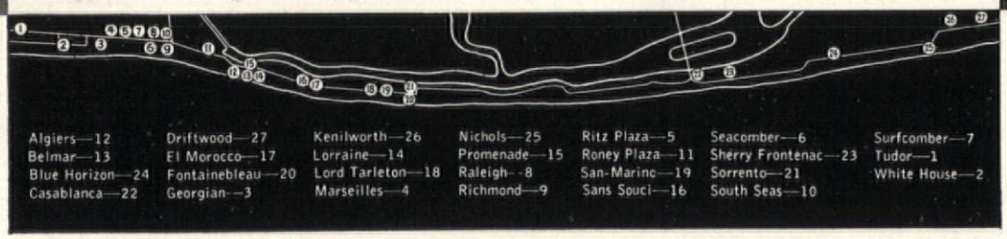
IF YOU ARE ABOUT TO AIR CONDITION ANY BUILDING . . . *consult with experienced York Engineers as so many others have done. York brought the right kind of cooling to the Empire State Building and to Cincinnati's Netherland-Plaza Hotel, for example—and, of course, to the 27 Miami Beach hotels shown on the map below. Recent contracts include Denver's new and exciting Mile High Center, the Equitable Life Assurance Society Building in San Francisco, the new Webb & Knapp 34th Street Office Building in New York City and Philadelphia's fabulous new Penn Center.*



Algiers—12
Belmar—13
Blue Horizon—24
Casablanca—22
Driftwood—27
El Morocco—17
Fontainebleau—20
Georgian—3
Kenilworth—26
Lorraine—14
Lord Tarleton—18
Marseilles—4
Nichols—25
Promenade—15
Raleigh—8
Richmond—9
Ritz Plaza—5
Roney Plaza—11
San-Marino—19
Sans Souci—16
Seacomber—6
Sherry Frontenac—23
Sorrento—21
South Seas—10
Surfcomber—7
Tudor—1
White House—2

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the quality name in air conditioning

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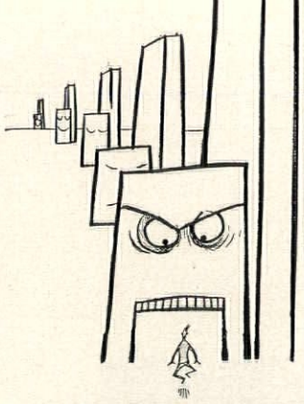


"People who are not going to a building have quite a different attitude toward it than people who are going to it."

BOOKS

ARCHITECTURALLY SPEAKING. By Eugene Raskin. Illustrated by Robert Osborn. Reinhold Publishing Corp., 430 Park Ave., New York 22, N.Y. 129 pp. and intro. 5½" x 8½". $3.50

"Architects and critics have spoken of architecture as though it were a thing apart from man. They have looked upon 'scale,' 'rhythm,' 'proportion,' etc. as though they existed all by themselves, and could be good or bad, right or wrong, without reference to man and his psychophysiological nature."

Tracking down architecture to its human meanings, Author Eugene Raskin characterizes it as a trio of emotions—emotion intended (the purpose of the architect), emotion evoked (the response of the observer), and emotion inherent (the capability with which the structure expresses the architect's purpose and evokes the observer's awareness).

This may sound like heavy going but it is not, because Raskin, associate professor of architecture at Columbia and one of the quickest-witted panel participants extant, has the rare and happy faculty of knowing how to present an original, closely reasoned, frequently profound point of view without obscurity and with disarming unpretentiousness. To compress his arguments is unfair to his easygoing, conversational style.

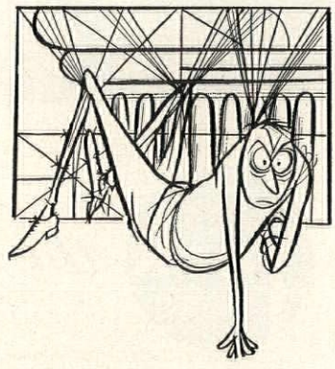
As a sample, he has this to say on what buildings tell about their creators:

"Through their choices, designers, as well as all other people, reveal their attitudes, opinions, prejudices. . . . Merely by looking at a jail one can tell whether the architect thought of penology as the punishment of evildoers, the storage of society's refuse, or the curing and rehabilitation of the socially ill. Or if he thought not at all and merely copied other jail 'types,' that will show too. Incidentally, 'copying' is the word one uses in cases when one disapproves of 'research.'

"Consider, for another example, the typical New England town meeting hall. The approach is low and simple . . . the doorway is intimate in scale for a public building, and unimposing in detail. There are no gates or fences; everything emphasizes ease and naturalness of entry. To come to this building, in the unspoken but clearly expressed opinion of the designer, is an everyday, unremarkable act. Inside, too, the close relationship between the platform and the house states again the right, quietly affirmed, of every individual in the community to take part in—or rather, to be—his government.

"Contrast this with the palace of a German or Austrian emperor or with Buckingham Palace, for that matter . . . all the flummery, which at monumental scale says, 'Keep Out. You are not the government here. You are the governed. You had better bend your head and step gently.'

continued on p. 174



"Inconceivable quantities of energy and paper have been consumed in fruitless efforts to formulate rules for proportion-in-general."

ALUNDUM aggregate widens the field for Terrazzo

A non-slip walking surface, wet or dry — that's what you get with ALUNDUM aggregate in terrazzo. In fact, it makes possible the architectural advantages of terrazzo in many places where regular terrazzo might not be practical — where floors are wet, on stairways, on ramps. ALUNDUM aggregate also adds durability to terrazzo — an important advantage in places where traffic is concentrated.

See Sweets File or write for your own copy of the new edition of catalog 1935-F.

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The addition of this business is in line with The Russell Company policy of continually expanding its manufacturing, sales and merchandising facilities.

The Hunter Corporation's "know-how," in the highly specialized field of Aluminum Prime Windows, adds great new strength to The Russell Company. The Hunter sales and merchandising policies will be faithfully carried on and integrated into the broad Russell operation.

STATEMENT OF POLICY

PRODUCT NAME: the company will manufacture and merchandise a complete line of Aluminum Prime Windows under the name of RUSSELL *Aluminum* PRIME WINDOWS.

SALES ORGANIZATION: the Hunter sales force will continue to serve its present customers and will be augmented to handle new business now available through the enlarged facilities of The F. C. Russell Company.

MANAGEMENT: Mr. J. M. Gwynne, formerly Vice President of The Hunter Corporation, will direct the Russell Aluminum Division as Vice President and General Manager.

EXPANDED FACILITIES: full production will continue at the Bristol plant until new and larger manufacturing facilities are prepared at The F. C. Russell Company's extrusion plant, Cambridge, Ohio.

CUSTOMER POLICY: the fine relationship existing between The Hunter Corp. and its customers was one of the deciding influences in the purchase of this company by Russell and everything will be done to maintain and improve this relationship. This division will meet all deliveries, without interruption to service. The same high quality, in all products, will be maintained. *All Russell products are sold through dealers.*

ORDERS: all present orders on the books of The Hunter Prime Window Division will be completed on time.

For further information about Russell Aluminum products—or information about valuable new Russell Distributor and Dealer franchises—please write to: Dept. 5-AF 15.

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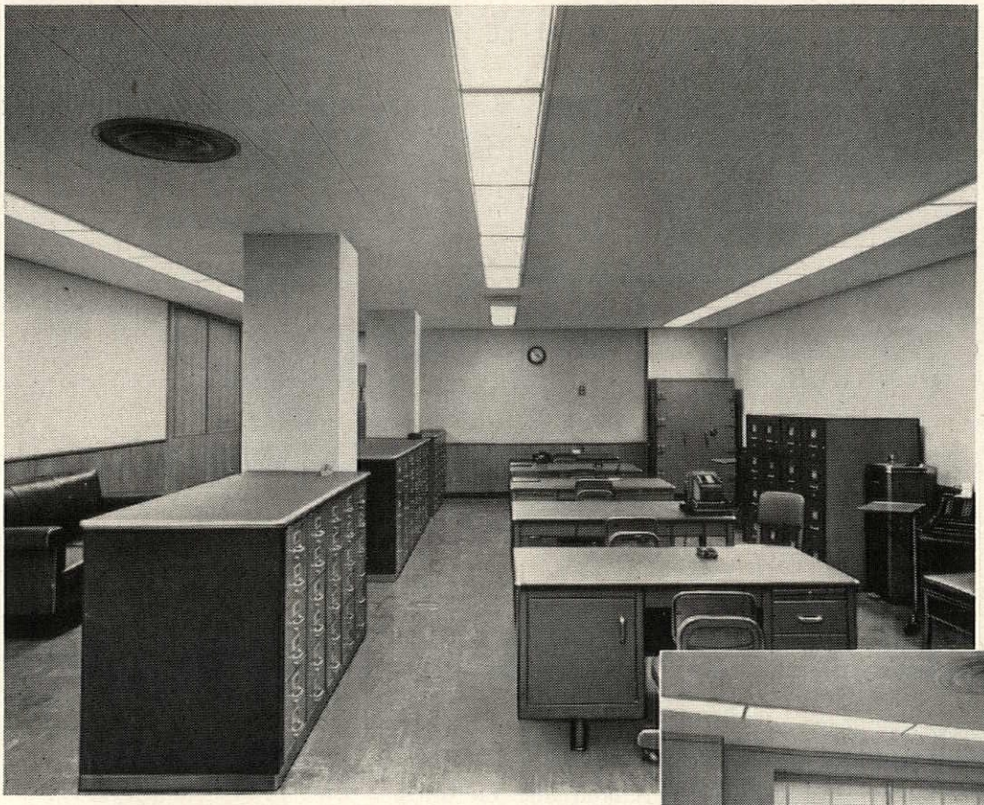

Treasury Department

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Where illumination's concerned sales-minded electric utilities want the best. This one in Kentucky uses two types of standard LITECONTROL fixtures for efficient control of light . . . and smart appearance. Rolled-edge trim helps *hide* uneven spots in ceilings that flat trims only emphasize.

In the executive office, LITECONTROL No. 5134 with Holophane No. 9016 low brightness lens provides ample illumination—free from glare and sharp contrasts.

Easy to maintain. Lenses help keep dirt out. To clean — simply *push trigger-catch,* open door, wipe surfaces with damp rag, and *push door shut* — no tools required.

At left, LITECONTROL fixture No. 5838 is a practical selection for the general office. Rugged, all-metal design provides 35 to 25 degree cutoff from egg-crate louvers . . . holds glare down at critical viewing angles. No tools needed for servicing.

Two more examples of the "More Light and Looks for Your Money" you get with *every* LITECONTROL Fixture.

INSTALLATION: Kentucky Utilities Company, Lexington, Kentucky.
ARCHITECT: Robert W. McMeekin, Lexington, Kentucky.
LIGHTING ENGINEERS: R. W. Wilson, J. T. Cole & K. R. Cardey, Kentucky Utilities Company.
DISTRIBUTOR: Graybar Electric Company, Inc., Indianapolis, Indiana.
ELECTRICAL CONTRACTOR: Hatfield Electric Company, Indianapolis, Indiana.

Treasury Department

FIXTURES: 18 No. 5838, 3-lamp recessed louvered fixtures on 9′ centers — standard cool white 96T12 lamps.
INTENSITY: Room average, 90 footcandles. Desk Tops 75-80 footcandles.

Typical Private Office

FIXTURES: 8 No. 5134, 3-lamp recessed fixtures with No. 9016 lenses on 8′ centers — standard warm white 48T12 lamps.
INTENSITY: Room average, 70 footcandles. Desk Tops, 85 footcandles.

Note: Intensity figures by Kentucky Utility engineers after three months operation.

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Fixtures
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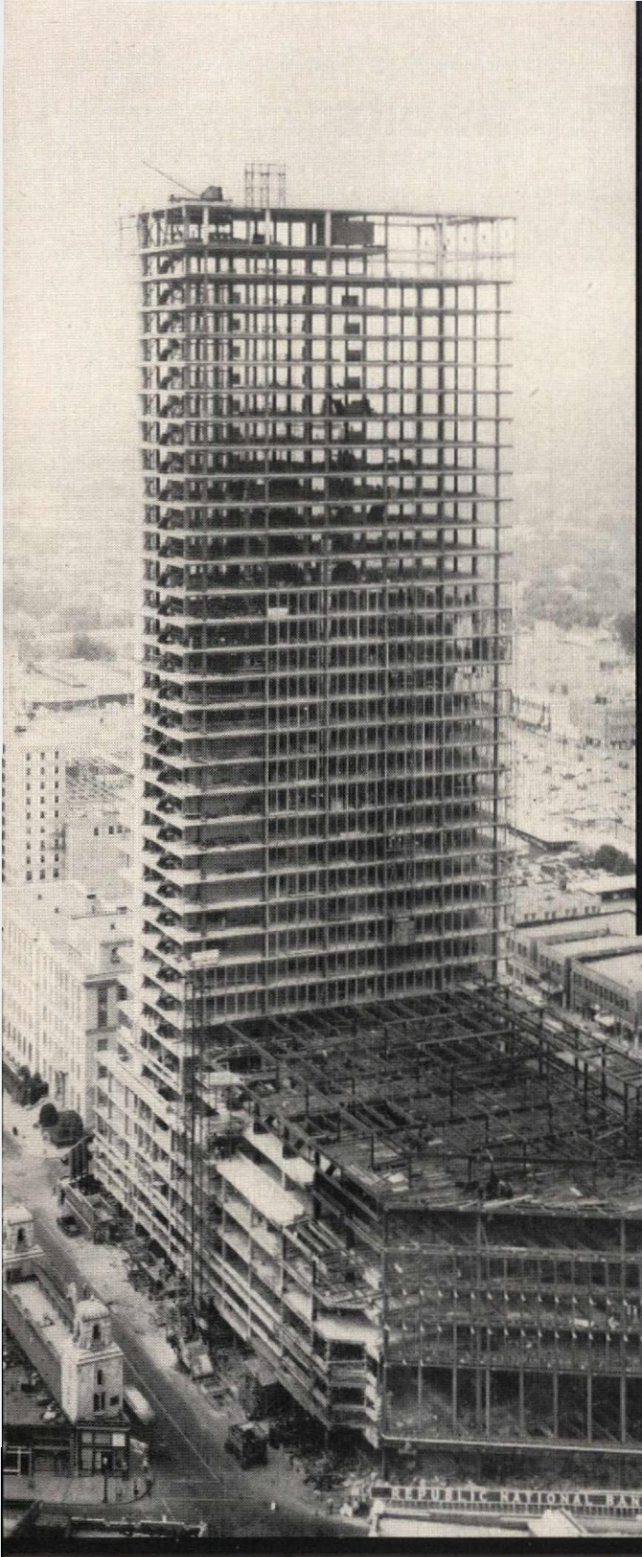


Southwest's TALLEST Building

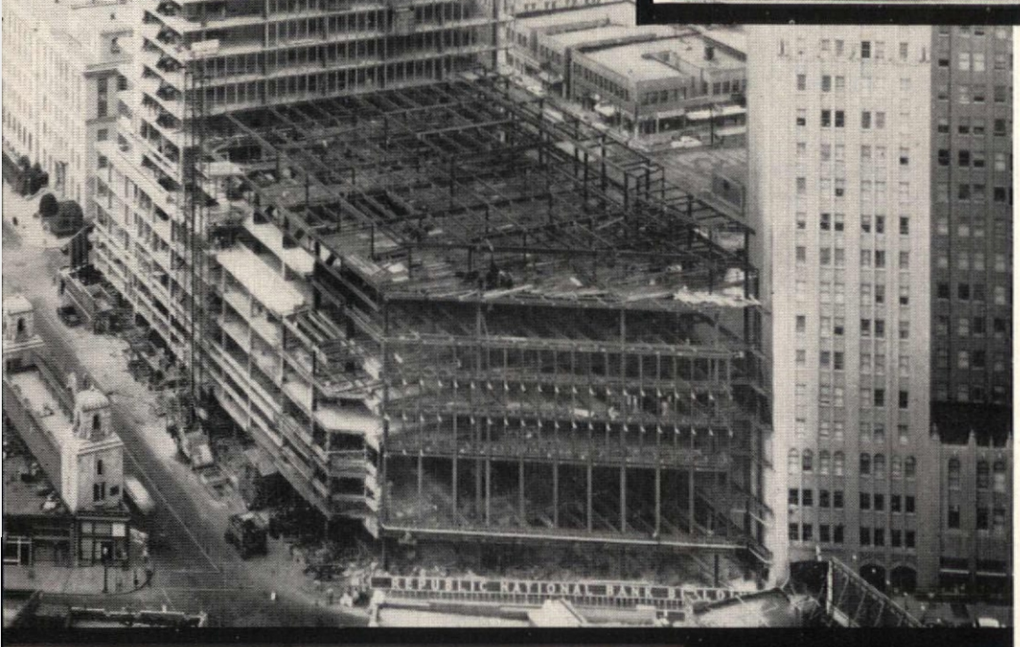
by AMERICAN BRIDGE

Republic National Bank Building, Dallas, Texas

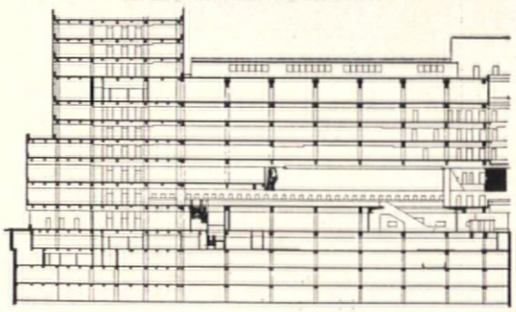
Architects: Harrison & Abramovitz; Gill & Harrell

Structural Engineers: Edwards & Hjorth

Structural Steel Fabrication and Erection: American Bridge



Right: Trusses on top floor of banking wing from which floors below are hung to free main banking room of columns. **Below:** cross section of banking wing showing 4-level underground parking floors and 2-story main banking room above ground floor.



DEEP IN THE HEART OF TEXAS, looming high and handsome above an imposing skyline, the new 36-story home of the Republic National Bank of Dallas is the Southwest's tallest building.

Covering more than an acre of land in the center of the thriving metropolis, this $25,000,000 building stands as another everlasting example of the strength and versatility of steel construction. 14,000 tons of structural steel went into its gigantic riveted frame—all of which was fabricated and erected by AMERICAN BRIDGE.

One of the interesting applications of the steel frame construction is the use of huge trusses in the bank wing's top story from which the floors above the main banking room are suspended, thus freeing the expansive, two-story main banking room of interior columns.

Your architect or consulting engineer can be relied upon to specify the type of construction best suited to your project. And AMERICAN BRIDGE has the experience, the equipment and technically skilled personnel to handle all types of steel construction with economy and dispatch – any time, anywhere. Our nearest office welcomes an opportunity to figure on your next job.

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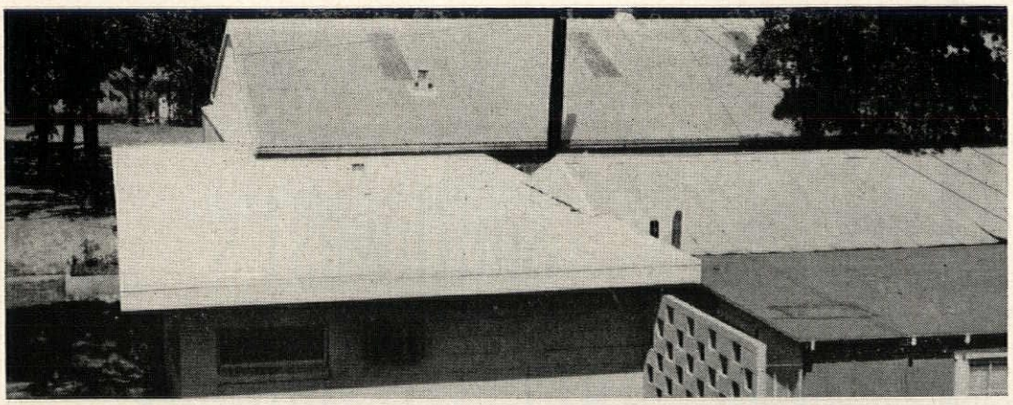
AMERICAN BRIDGE

5-68

UNITED STATES STEEL



A. E. Betzel Engineering Company, Arlington, Texas. *Mr. A. E. Betzel, President, says:*

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"We have found," Mr. Betzel explains, "that the Kaiser Aluminum corrugated industrial sheet on our new plant reflects the rays of our hot Texas sun so effectively that we are enjoying a marked improvement in output and efficiency."

When you specify Kaiser Aluminum sheet, you can expect this same kind of client satisfaction. Here's why:

Kaiser Aluminum sheet not only keeps interiors as much as 15° cooler under hot sun, it provides winter insulation. Interior heat is reflected back into working areas.

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For A.I.A. File and complete information, contact the Kaiser Aluminum sales office listed in your telephone directory. Or write Kaiser Aluminum & Chemical Sales, Inc. *General Sales Office,* Palmolive Bldg., Chicago 11, Ill.; *Executive Office,* Kaiser Bldg., Oakland 12, California.

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Corrosion resistance—High resistance to most industrial fumes. Can't streak with red rust stains. Maintains its attractive appearance indefinitely.

Strong—The increased depth (7/8") of the corrugations of Kaiser Aluminum Roofing provides greater load carrying capacities over the longer spans required in modern industrial construction.

Low Maintenance—Never needs painting. Resists heavy winds and hail.

Cooler, Brighter Interiors—By reflecting hot sun rays, aluminum keeps interiors as much as 15° cooler. Aluminum's high reflectivity insures extra interior light.

BOOKS

Continued from p. 170

"The character of these buildings derives from the opinions held by the architects. The opinions, of course, come from the society as a whole, but it is through the architect in the case of architecture that they are expressed.

"What opinions on government do architects hold today? Let us look at the newest governmental buildings and see. They are large, simple, clean in line and surface, mechanically exact in their rhythmic patterns. Do they welcome you in? Do they say, 'Keep out'? Neither. They do not care about you as an individual at all. How you feel about them does not matter one whit. You are a number on a social security form, in an income tax file, on a draft register, in a census report. As your number comes up, so will you be treated, not with love and not with terror but as a number is treated—impersonally. . . .

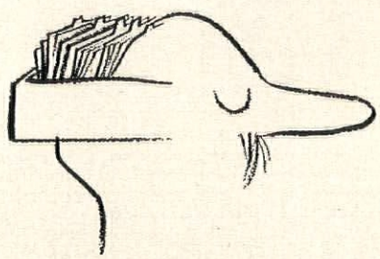
"I submit that whether we like it or not (I certainly do not!) this impersonality is the inescapably clear opinion of the architects.

"It is expressed in other ways. No one, for instance, could design a Stuyvesant Town unless he thought of people numerically, as replaceable tenants, rather than as warm, breathing, eternally different individuals. Of course, impersonality is not the only opinion held by contemporary architects. . . ."

But if compressing the book's argument would falsify its tone, neither does piecemeal quotation do justice to its carefully constructed thesis that a concrete, operational analysis can be applied to the intangibles of architecture. Viewed not as abstractions but as concrete specifics, the familiar materials of style, unity, scale, rhythm, proportion, sequences, composition and functionalism take on some new and unexpected looks.

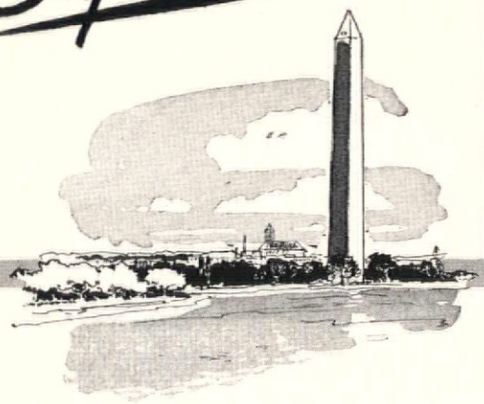
Many architects will want to quarrel with the author's conclusion on unity: "Clarity of concept is the inescapable basis for unity. It may be argued that this statement is arbitrary in its exclusion of such matters as easily apprehended shapes—spheres, triangles, etc.—which permit the eye a simple comprehension of unity in pure form; it is my contention that there is no such thing as unity in pure form; to the mind ignorant of the concepts, the shapes have no meaning. As a *device for facilitating conceptual ex-*

continued on p. 178

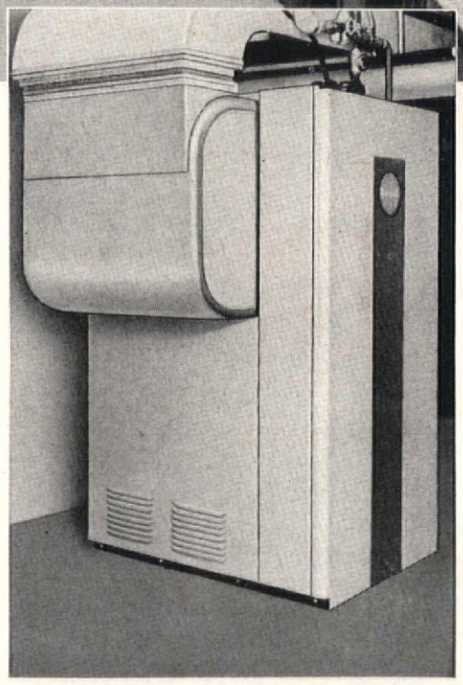


"When we look at any object, we go through a process very much like searching through the file for a card which matches what we see. If we cannot find a card we tend to sneer or shrug and turn away."

Servel air-conditions MPAA's *Little Theater for Big Names!*



Interior of the Servel air-conditioned screening room of MPAA's unique Academia Theater in Washington.



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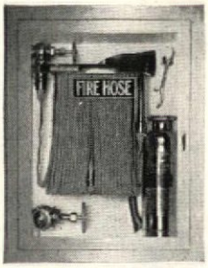

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BOOKS

Continued from p. 174

pression in buildings, the use of readily understood forms has great value, however. . . .

"The selection of particular shapes is . . . to be ranked with other architectural devices such as scale, color, harmony, ornament, rhythm, dominance, subordination, etc., which are used to enhance conceptual unity but which in themselves are not the unity."

Before deciding to accuse the author of rewriting the architectural dictionary, the reader should give himself the pleasure of accompanying Raskin to this conclusion via musings on the visual effect of the horseless carriage, the naïve gentleman who searches frantically through his "brain card file" when first confronted with a Le Corbusier house, and the jungle dweller who encounters a radio-phonograph-TV set.

Osborn's uninhibited, wacky "drawings of ideas" are wonderfully suitable—far more so than illustrative photographs would be—since this is decidedly a book of ideas, and not at all a guided tour of particular buildings.

There is one flaw in the execution. Raskin seems not to have decided fully whom he is addressing—a sophisticated colleague, his architectural students or the general public. Sometimes his shuttling among these three levels is a little disconcerting. But since we are all a combination of worldlings and innocents to one degree or another, it is a defect not too hard to bear with.

"But if the owner some morning should attempt to dress in some other sequence, the arrangement would prove so awkward . . ."

TV STATIONS. By Walter J. Duschinsky. Published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 136 pp. 9" x 12". Illus. $12

This is the first book dealing with the planning and design of television stations.

Part I deals with the master planning which precedes construction, and Part II deals with the practical problems that arise in the operation of a TV station. The appendix gives actual examples of UHF-TV planning as well as other pertinent data. Supplementing the text are 135 illustrations showing TV equipment of all types, station facilities and plant layouts.

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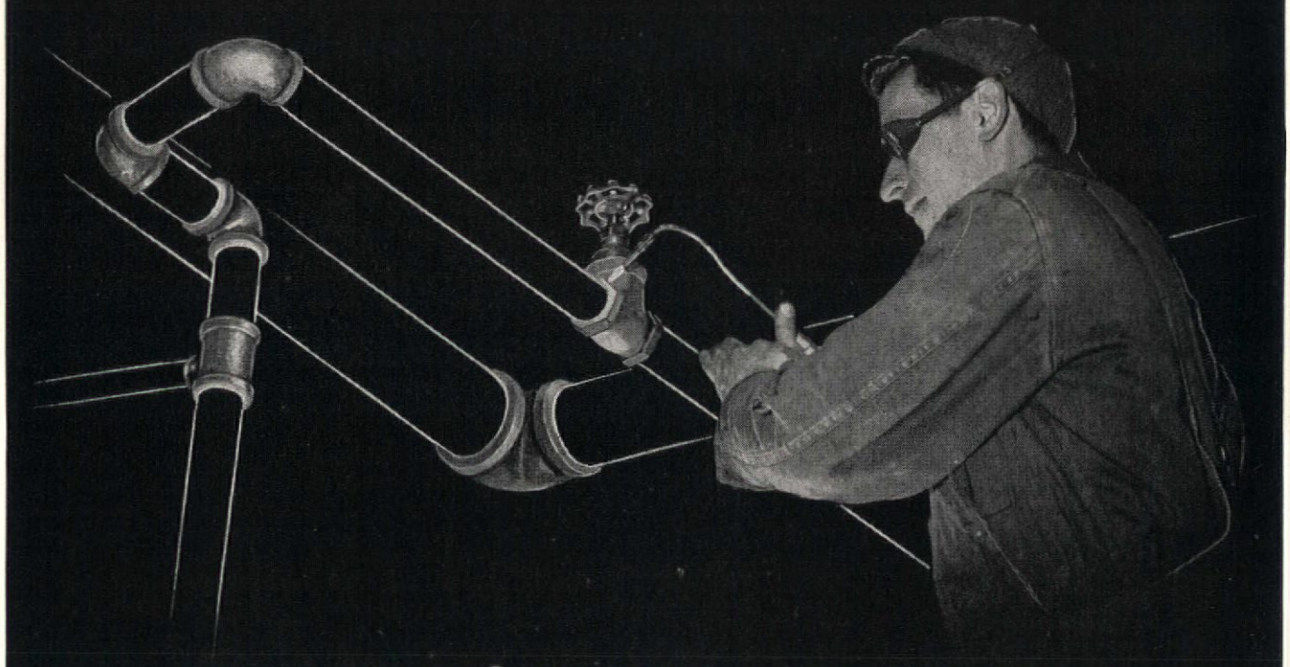

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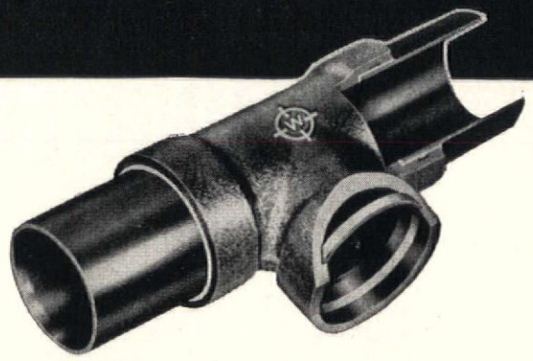

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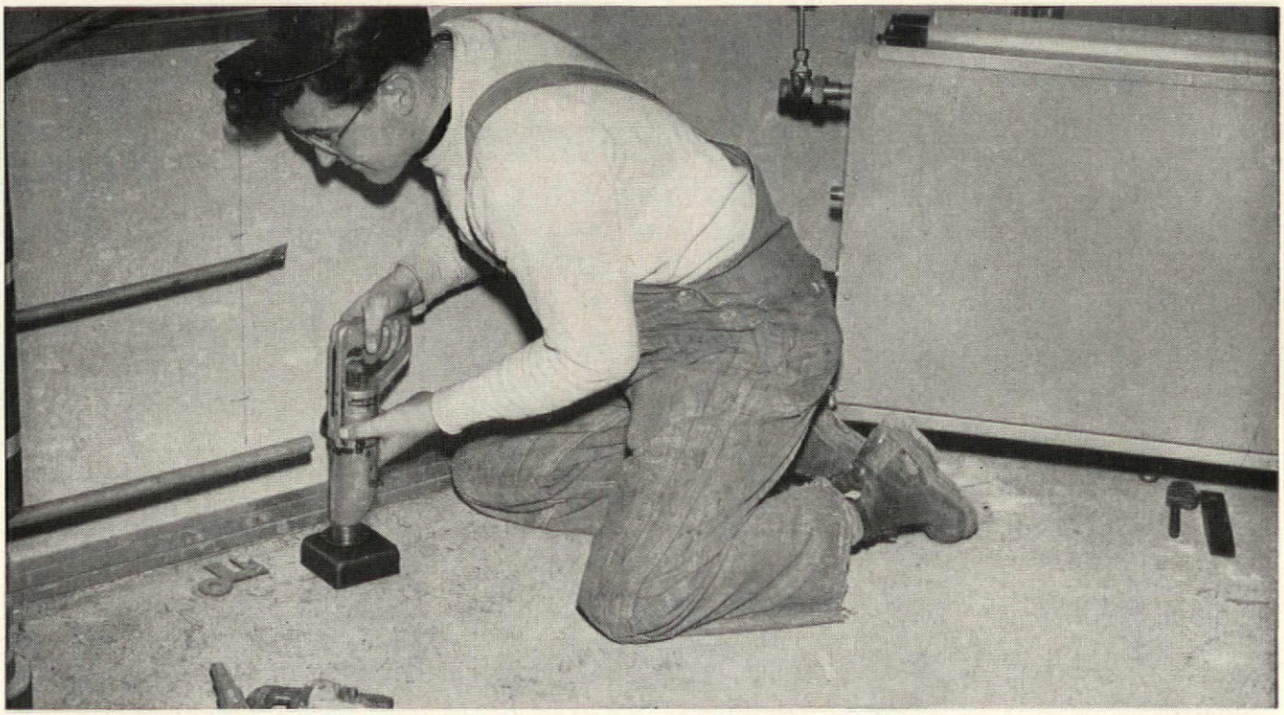

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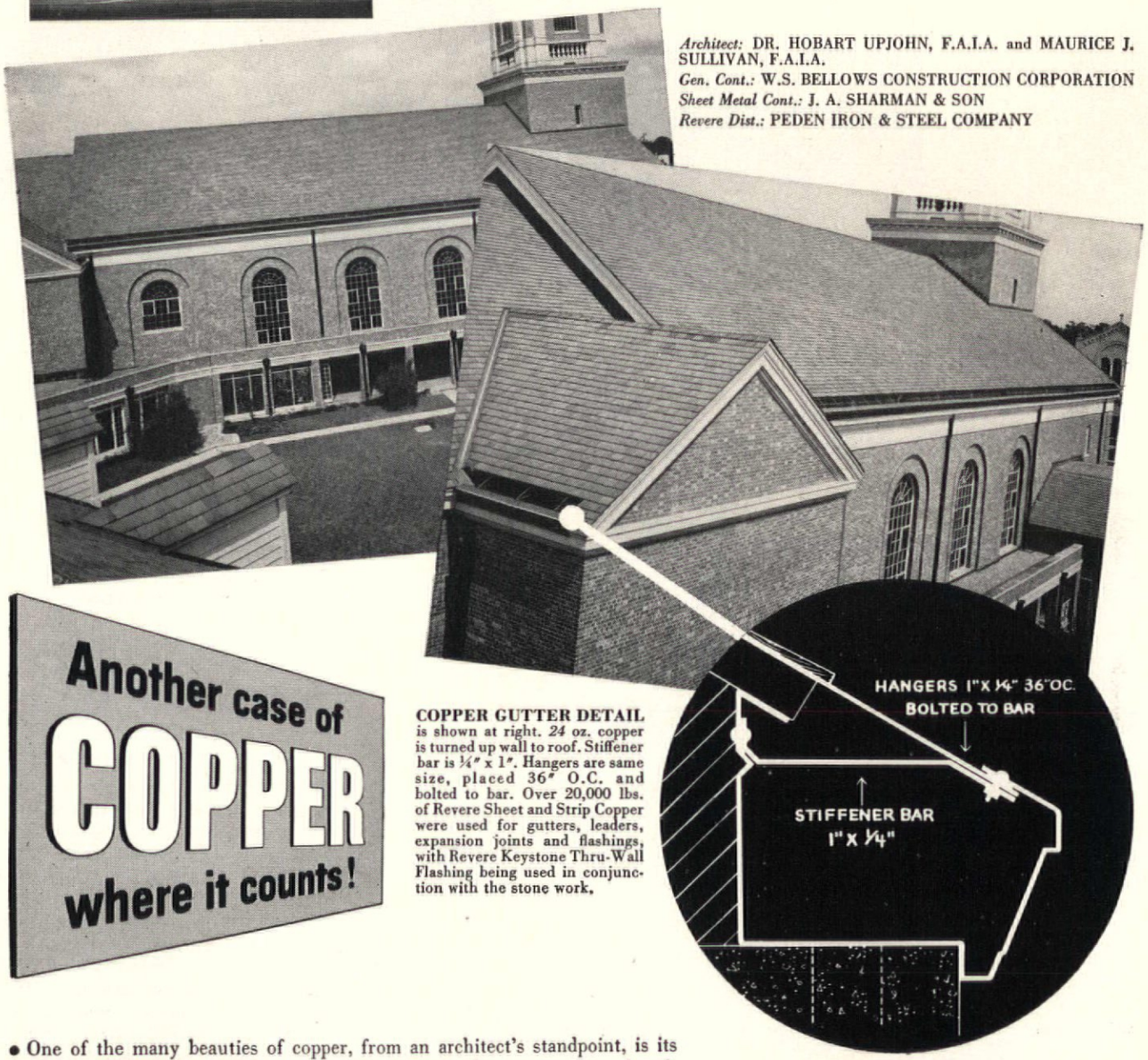

Another case of COPPER where it counts!

COPPER GUTTER DETAIL is shown at right. *24* oz. copper is turned up wall to roof. Stiffener bar is ¼" x 1". Hangers are same size, placed 36" O.C. and bolted to bar. Over 20,000 lbs. of Revere Sheet and Strip Copper were used for gutters, leaders, expansion joints and flashings, with Revere Keystone Thru-Wall Flashing being used in conjunction with the stone work.

• One of the many beauties of copper, from an architect's standpoint, is its versatility, design-wise. Copper is as much at home in the most modern church as it is in an ancient Roman Cathedral. Take, for example, the new, smartly-designed church shown here. Note how the copper box gutter has been made to blend in with the roof line, how neat the stepped-down flashing appears around the steeple and adjoining wall and how the decorative leaders have been designed to become a part of the brick pillars on the lower level.

In addition to its practically unlimited design possibilities copper cannot rust or rot. Its endurance has been proved for centuries. The enviable reputation copper has earned makes it readily acceptable by the toughest board of directors. Contractors prefer to work with it because it solders beautifully, requires no special tools, is readily worked into any shape or form and is readily prefabricated in the shop. Write us today about the money-saving advantages of Revere Keystone Thru-Wall Flashing*. And, if you have technical problems, we will put you in touch with Revere's Technical Advisory Service.

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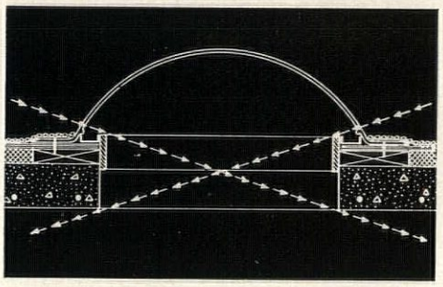
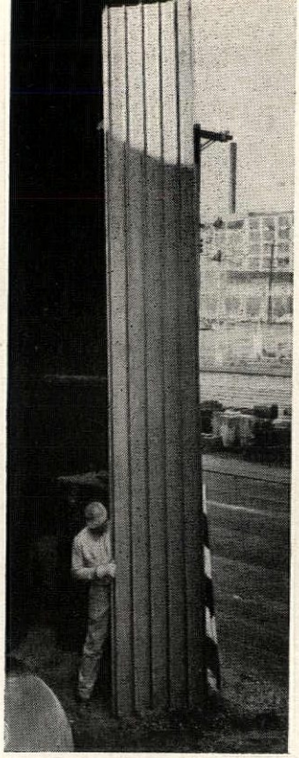
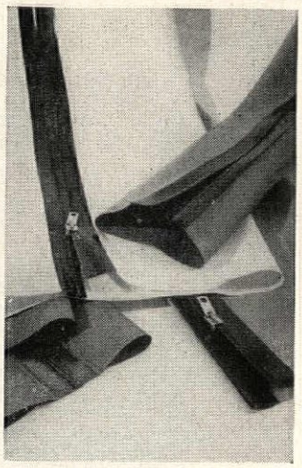


More light through
low down-dome (p. 190)

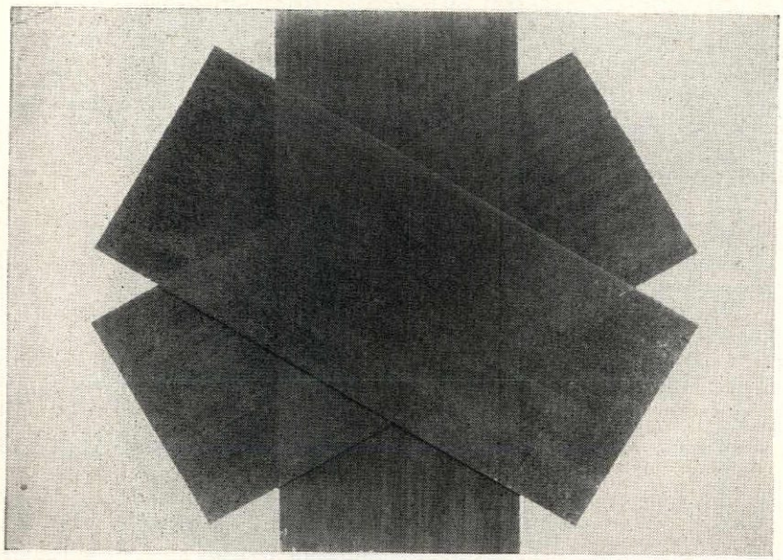


Faster roofing with
long deck (p. 216)

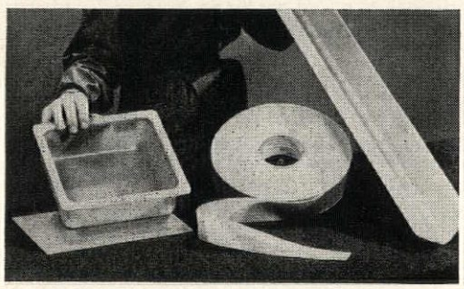


Zippered weskits for
insulated pipes (p. 202)

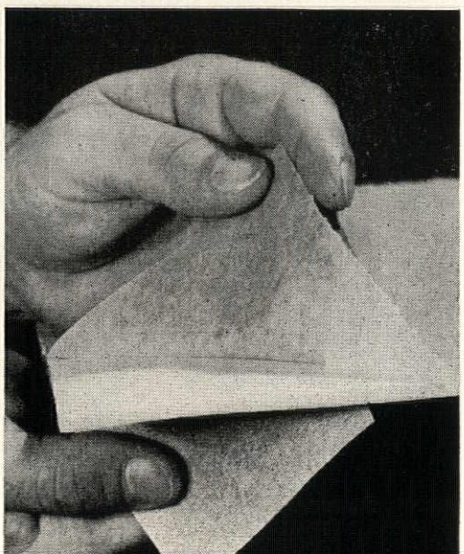
Strong plastic-glass sheet is tailor-reinforced to fit stress conditions



Isotropic laminate gives "Sotchply" equal strength in all ply directions



Strong end products (up to 40' long, 6' wide are made in simple molds with little pressure, moderate temperature. The sheet stock comes ready for molding, protected by peel-off tape.



Scotchply may soon mean to plastics in construction what plywood has meant to lumber. Throwing wide open the fabrication of large, strong plastic end products by making reinforced sheet easier to form than sheet steel, this new laminate is very much a modern building material. As a result, its owner, Minnesota Mining, may never notice when *Scotch Tape* patents expire two years from now; the alert firm will be too busy turning out *Scotchply* structural material.

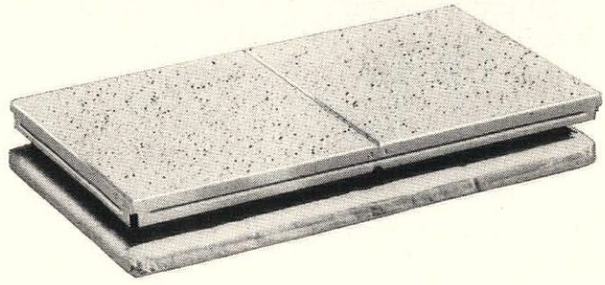
Scotchply plastic is an uncured sheet stock of glass fllament layers, preimpregnated with epoxy resins. Readily formable before curing, it can be drawn like sheet steel. After processing, the laminate becomes a stable structural material with high-tensile (41,000 psi) and flexural (64,500 psi) strengths, with a heat distortion at 264 psi of 350° F, and dielectric strength of 700 v. per mil. Its controlled processing assures uniformity in physical and chemical properties and obviates much of the time consumed and messiness of hand layup methods used in producing similar material.

Unlike polyester laminates that are reinforced by either a random web or woven mat of glass fibers, *Scotchply* is bolstered by directional layers of continuous glass filaments. Making up 60% of the material (and in some special types 80%), the lineally aligned filaments behave like tiny but effective reinforcing rods. The epoxy resins, comprising the remaining 40% (or 20%), surround each thread and saturate the plies. These sheaths of high power epoxy keep the glass from giving in to its own brittleness, making it possible to capitalize on its excellent tensile strength and stability. (Amazing adhesives, epoxies have been known to stick permanently almost any material to

continued on p. 186

NEW Spatterfect ACOUSTIMETAL

. . . a fresh concept in sound conditioning



You can now give ceilings striking visual appeal...as well as a noise reduction coefficient range of .80-.90...with Gold Bond Spatterfect Acoustimetal.

The tiny holes in each unit are camouflaged by an attractive dark green paint pattern. Here is smart decoration...*plus* efficient sound conditioning from Gold Bond Rock Wool Acoustipads behind every perforated metal unit.

Acoustipads are incombustible. They combine with steel Acoustimetal units to make a completely fire-resistant ceiling installation. The Gold Bond Spatterfect finish is easily washed with soap and water. And this easy maintenance makes Acoustimetal a truly economical form of sound conditioning.

Your Gold Bond Acoustical Contractor is a qualified sound control expert who can show you just how to install the acoustical ceiling that's best for your design. Ask to see all seven Gold Bond Acoustical products...there's one for every job and budget.

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Spatterfect, actual size

Build better with Gold Bond®

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. . . ACOUSTICAL PRODUCTS

Case history of CECO on-the-job performance

Bryant Trewyn Junior High School, Peoria, Illinois
Hamilton B. Dox, Architect
George D. Johnson Company, Contractor

problem: meet a school building budget

solution: Ceco products...
saved 30% in concrete
saved 30% in deadload
saved 30% in roof costs

CECO PRODUCTS USED

Open-Web Steel Joists
Steel Roof Deck
Reinforcing Bars and Welded Wire Fabric
Meyer Steelform Service
Steel Architectural Projected Windows
Metal Lathing Products

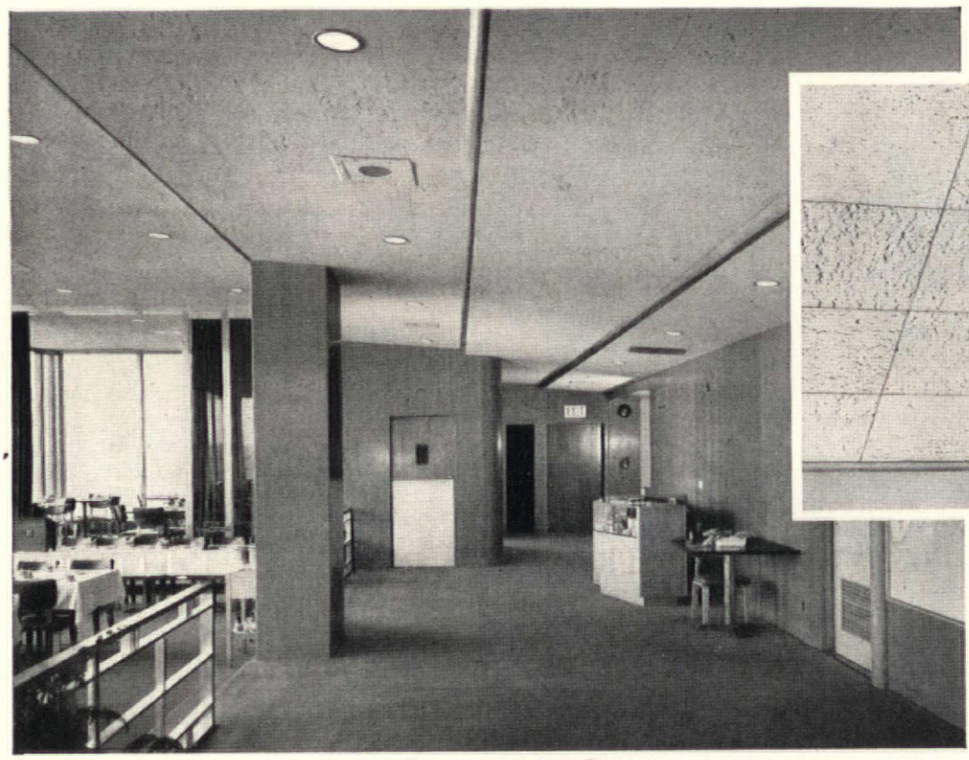
In construction products
CECO ENGINEERING
makes the big difference

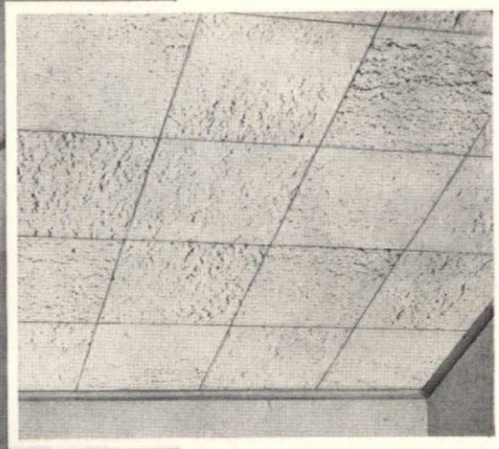
When a school building budget demands costs be cut to the bone, savings must be made from the ground up. And that is what Architect Hamilton B. Dox did with the Bryant Trewyn School. First there was the matter of basic structural methods. The architect and contractor brought Ceco into the planning—and together worked out the most efficient ways to frame the floors and roofs.

Ceco Steel Joists, chosen for classroom areas . . . saved 30% in concrete compared to heavy concrete framing—saved 30% in deadload—saved two months' erection time.

Ceco-Meyer Concrete Joist Construction, selected for the gymnasium area—provided rigidity—fire safety—speed—efficient design to reduce deadload . . . offered equally important savings. Then decking got the critical eye. When precast concrete design was compared with Ceco Steel Roof Deck, a saving of 30% in cost was chalked up for the Ceco method. Standard Ceco Architectural Projected Windows were chosen to eliminate the extra cost of special fabricating. Ceco Service met the construction schedule to the day—another example of saving through planning. CECO STEEL

CECO STEEL PRODUCTS CORPORATION
Offices, warehouses and fabricating plants in principal cities
General Offices, 5601 W. 26th Street, Chicago 50, Illinois





The Johns-Manville Permacoustic Ceiling in the beautiful Bradley Airport Terminal restaurant provides quiet and comfort despite noisy aircraft traffic outside.

A beautiful Solution

TO NOISE-CONTROL PROBLEMS...

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decorative acoustical tile

Specify J-M Permacoustic® tile for ceilings that provide unusual architectural beauty with maximum acoustical efficiency and fire safety.

Johns-Manville Permacoustic is exceptionally sound-absorbent. It is attractive and noncombustible. It is available with either a textured or fissured surface. These random-textured finishes increase its noise-reduction qualities and provide design and decorative interest.

Made of baked rock wool fibres, Permacoustic is fireproof—*meets all building code fire-safety requirements.* Johns-Manville Permacoustic is easy to install on existing ceilings or slabs, or by suspension using a spline system of erection.

Send for your free copy of the new brochure about Permacoustic tile. Write Johns-Manville, Box 158, New York 16, New York. In Canada, write 199 Bay St., Toronto 1, Ontario.

INFORMATIONAL DATA ON PERMACOUSTIC

Sizes 12" x 12" 12" x 24" | Thickness ¾"* | Color: white

	ACOUSTICAL EFFICIENCY	
	Test No. A51-98	Test No. A51-99
cycles per second	cemented to plaster board (mounting No. 1)	mechanically mounted on special metal supports (mounting No. 7)
125	.04	.56
250	.21	.53
500	.75	.60
1000	.88	.73
2000	.85	.88
4000	.78	.88
noise reduction coefficient	.65	.70
weight per sq. ft.	1.3	1.3

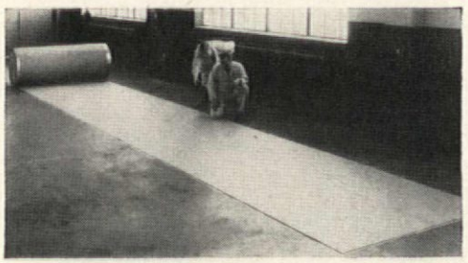
*Also available in ⅞" thickness

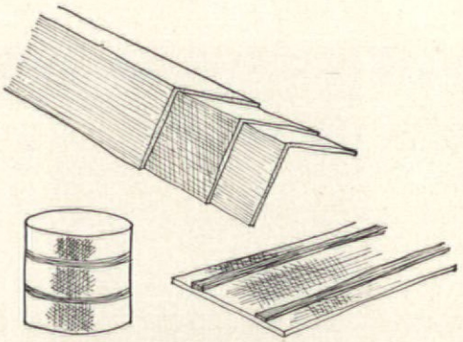
JOHNS-MANVILLE JM PRODUCTS **Johns-Manville**

40 YEARS OF LEADERSHIP IN THE MANUFACTURE OF ACOUSTICAL MATERIALS

PRODUCTS

Continued from p. 182





any other material, and are winning the title of "universal glue.")

For omnidirectional strength, the material is supplied in an isotropic arrangement, with filaments of three layers running at 120° angles to each other. *Scotchply* also can be supplied with filaments all in one direction or with layers strategically angled to best fit particular stress conditions.

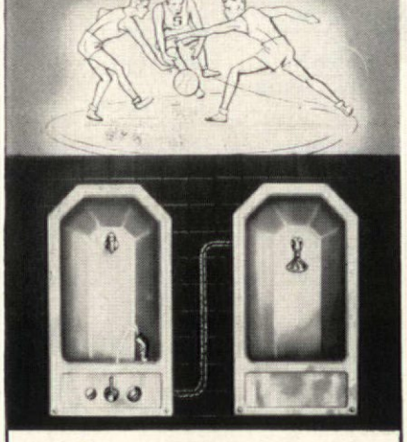
Although the new material's potential structural uses have not been explored fully, 3M is working out some shapes which take advantage of the intrinsic efficiencies of the material. Thus, the diagrams above, are suggested not necessarily as well-designed examples, but as typical of the kind of engineering thinking *Scotchply* makes possible. Bert Auger, 3M's chemical engineer, says the commonest error would be to try to compare the performance of *Scotchply* with that of steel and other materials under conditions evolved for those materials. Any comparison of I beams, therefore, is purely theoretical since what is an excellent shape for metals may not prove to be the best for glass-plastic. It would illustrate, however, that although heat-treated chrome steel is three times as strong as unidirectional *Scotchply* (260,000 psi as compared to 80,000 psi in tension) and 5½ times as stiff, when compared as actual I beams of equal weight the lower-density plastic has 2½ times the steel's strength and three times its stiffness.

Scotchply's own ply structure also permits special laminations with the adhesive epoxies. Facings could include microscopically thin metal foils and *Scotchlite*, 3M's reflectant granule sheeting used on highway signs and car bumpers. The dielectric *Scotchply* can also be printed with electrical circuits, a process that may make possible interior partitions with plastic skins that could have heating wires printed around the baseboard, or even light-diffusing ceiling panels with the pattern of radiant heating wires doubling as a decorative silhouette.

Manufacturer: Minnesota Mining & Mfg. Co., 900 Farequier Ave., St. Paul, Minn.

2 POPULAR SCHOOL *Combinations*

Halsey Taylor Counter-Type Fountain class-room unit, 20" x 30", with receptor of acid-resisting, gleaming white vitreous china or lifetime stainless steel. Chromium Plate Glass Filler and Fountain Head. All the usual Halsey Taylor sanitary features. Specify No. 4840.



This is an ideal combination for "gym" or athletic areas. The Halsey Taylor recessed Cuspidor, No. 4647, shown at right, is designed to be used with No. 4646 recessed wall type, shown at left. Special outlet supplies water to flushing jet of cuspidor. Semi-recessed models also available.

School boards and architects know that to specify Halsey Taylor drinking-water equipment is to provide the utmost in sanitation as well as trouble-free maintenance. Every Halsey Taylor product—whether fountain or cooler—is factory-tested for dependability in service . . . backed by years of specialization in manufacturing this type of equipment exclusively.

The Halsey W. Taylor Co., Warren, O.

HALSEY TAYLOR

AS-40

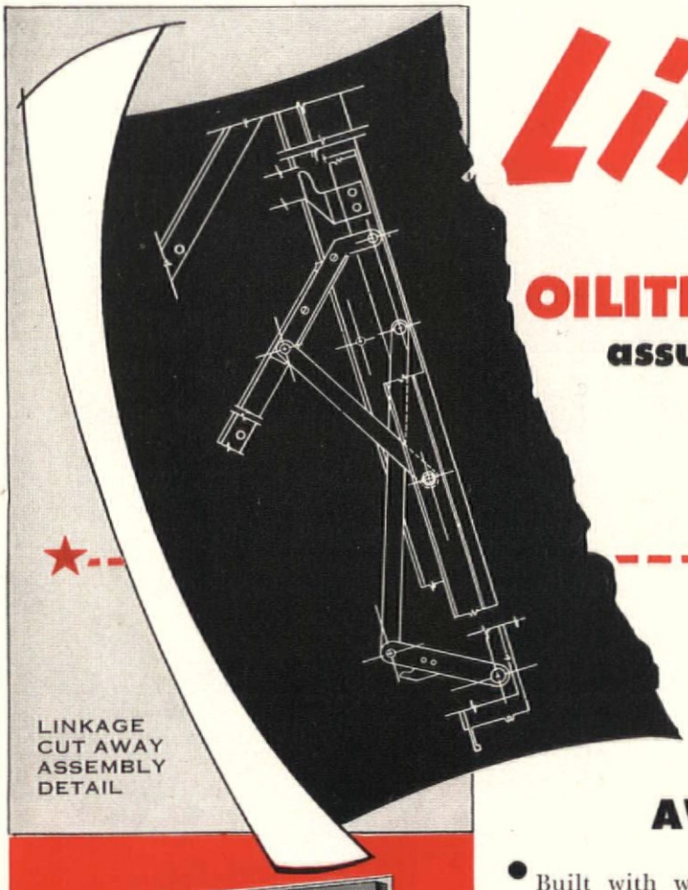
POLYVINYL PAINT for outside use lets interior vapor through masonry but shuts pores to rain

Advantages of latex paints go outdoors with Glidden's *Spred Glide-On*, a free-flowing polyvinyl acetate emulsion that can be brushed or rolled on to any exterior masonry surface. Like its indoor predecessor *Spred Satin*, *Glide-On* dries to the touch within a half hour, shows no lap or brush marks, and permits washing of applicator in warm, soapy water.

The coating's webbed molecules allow interior vapor to pass readily through but when wetted by rain, these molecules absorb moisture, expanding to form a watertight protective finish. *Glide-On* may be applied over concrete, stucco or asbestos-cement siding, and hydrogen sulphide (city soot) will not discolor it. It comes in 12 colors at $6.10 per gal.

Manufacturer: Glidden Co., Berea & Madison Ave., Cleveland 2.

continued on p. 190



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assures uniform activation of ventilators

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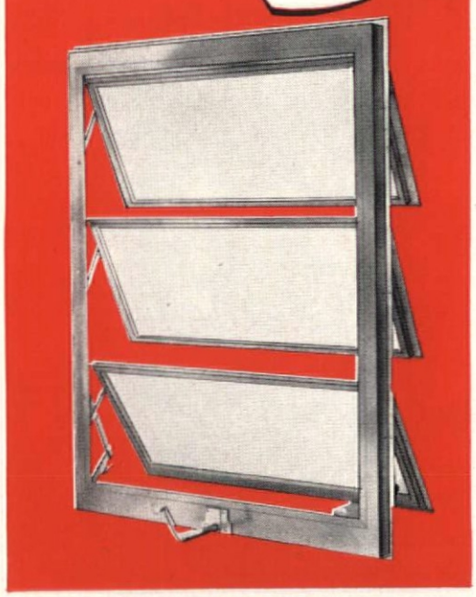

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Operating in conjunction with the heavy-duty built-in cam lock, and torsion bar encased in four oilite bearings, it has helped to establish the pace-setting preference Ualco Awning Windows enjoy throughout the building industry.

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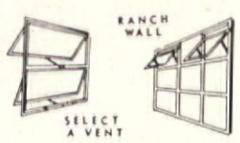

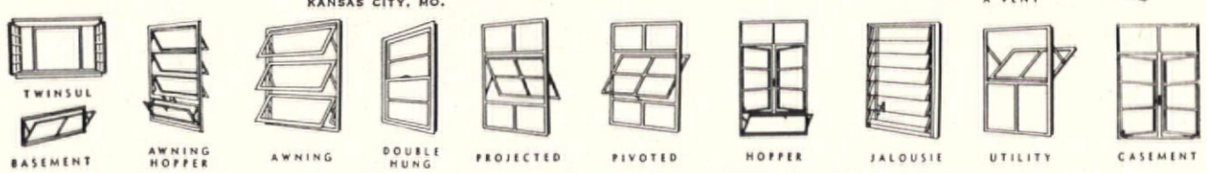

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In this respect, Westinghouse elevator modernization experts help most. Tailoring each installation to the conditions at hand, they specialize in making the *most economical use of existing equipment*—planning for greatest efficiency . . . recommending equipment to make your elevator system as modern as any found in the newest building.

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STATE . . . . . .

PRODUCTS

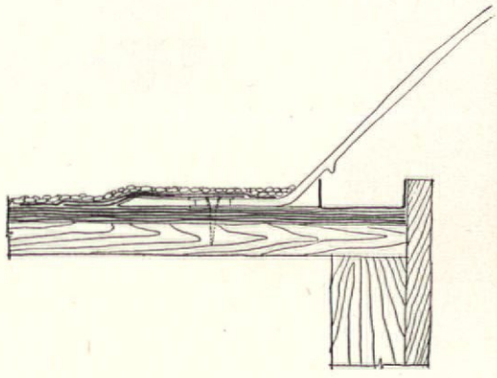
Continued from p. 186

SELF-FLASHING SKYLIGHT set into roofing lets through light at wide angle

Ever since the plastic domes fastened directly to the roof of the Fitchburg, Mass., library (AF, July '51) cracked, skylight fabricators have made a point of not constraining the highly expansive acrylic. It was this failure, in fact, that led Wasco Flashing Co. (called upon in Fitchburg's time of trial) to create the gasketed frame-on-a-curb it now packages with prefab domes (for recent Wasco developments, see p. 198).

But when Architect John Black Lee, designer of the AP acrylic skylight, planned skylights for his own New Canaan home, he wanted bubbles snug against the flat rooftop. Aware of the expansion characteristics of acrylic resins, but also intrigued by their unlimited molding potential, Lee worked out a dome with extended flat edges that could be held tight without trouble.

To attach the self-flanged domes to the roof securely while allowing sufficient give, the side flanges (not the corners which take the brunt of strain in the vacuum formation from flat sheet) are pierced with expansion bolts, washers and oversize bushings. The mechanic imbeds the flange



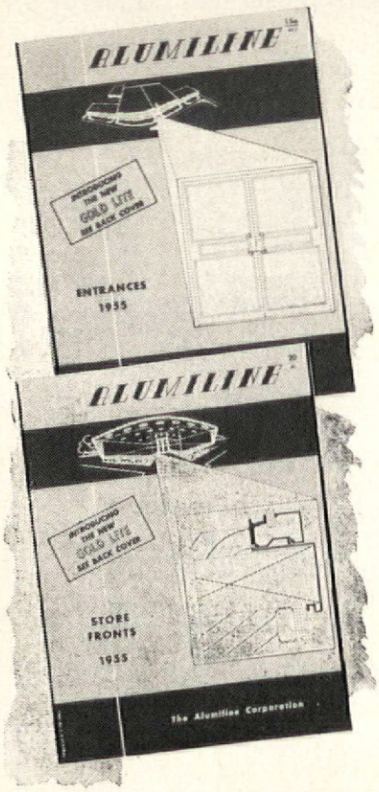
directly in the built-up roofing material, sandwiching it between layers of mastic and membrane to make it an integral part of the roof.

As for condensation, it could not be treated more matter-of-factly. Instead of being drained through an arrangement of gutters or tubes, the condensate is dripped

continued on p. 194

just off the press . . . and yours for the asking!

ALUMILINE 1955 CATALOGS



Practical and specific, expressly planned and prepared with your needs in mind, are these two reprints from Sweet's 1955 File. Many new innovations are shown in both catalogs. Among them is featured GOLD LITE, the new Non-Fading Gold Alumilite Finish. Use the coupon to request your copies of either or both TODAY. No obligation, of course.

ALUMILINE Store Front Construction

Includes detailed specifications and sectional drawings of Sash & Bead, Sash, Sill and Jamb, Bars and Muntins, Sills, Heads and Facia, Facia and Pilaster Covers, Curtain Wall Sections, Closure Members, Awning Flaps, and Structural Shapes. A very practical and useful working manual.

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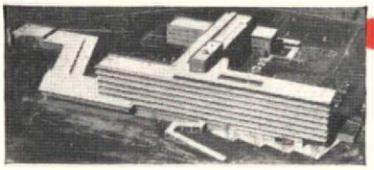

Lankenau Hospital, Philadelphia, recipient of 1954 First Honor Award by American Institute of Architects. Vincent G. Kling, architect; A. E. D'Ambly, mechanical engineer, both of Philadelphia.

Few hospitals command so much attention outside their community as the new Lankenau Hospital. Distinctive design, functional efficiency, superb facilities—its creators overlooked nothing which would contribute to a highly effective hospital plant.

Optimum temperatures for each of the many activities in the building are provided, effortlessly and accurately, by Johnson Automatic Temperature Control. In each of the 14 air conditioned operating rooms and in the delivery and nursery suites, Johnson *Individual Room* Thermostats and Humidostats constantly maintain the exact temperatures and humidities desired.

In the underground cobalt treatment room, and in the auditorium, cafeteria, kitchen, X-ray section and public areas, refreshing, even temperatures are insured by Johnson Controllers on the heating and ventilating systems. Other strategically located thermostats maintain patients' rooms at the prescribed comfort level.

An important fuel saving feature is the special Master-Submaster Control that varies the temperature of the hot water for the heating system in accordance with outdoor temperatures. *Like every Johnson System, this entire installation was designed specifically to satisfy the exact needs of each individual area in the building and insure the greatest return for every dollar spent for heating and cooling.*

In hospitals everywhere—and in all other types and sizes of buildings, new or existing—"Planned-for-the-Purpose" Johnson Control automatically insures the ultimate in efficiency, comfort and economy. Next time you have a temperature or humidity control problem, talk it over with an engineer from a nearby Johnson branch. He draws on the more than 70 years' experience of the only nationwide organization devoted exclusively to planning, manufacturing and installing automatic temperature control systems. His help is yours for the asking. JOHNSON SERVICE COMPANY, Milwaukee 2, Wis. Direct Branch Offices in Principal Cities.

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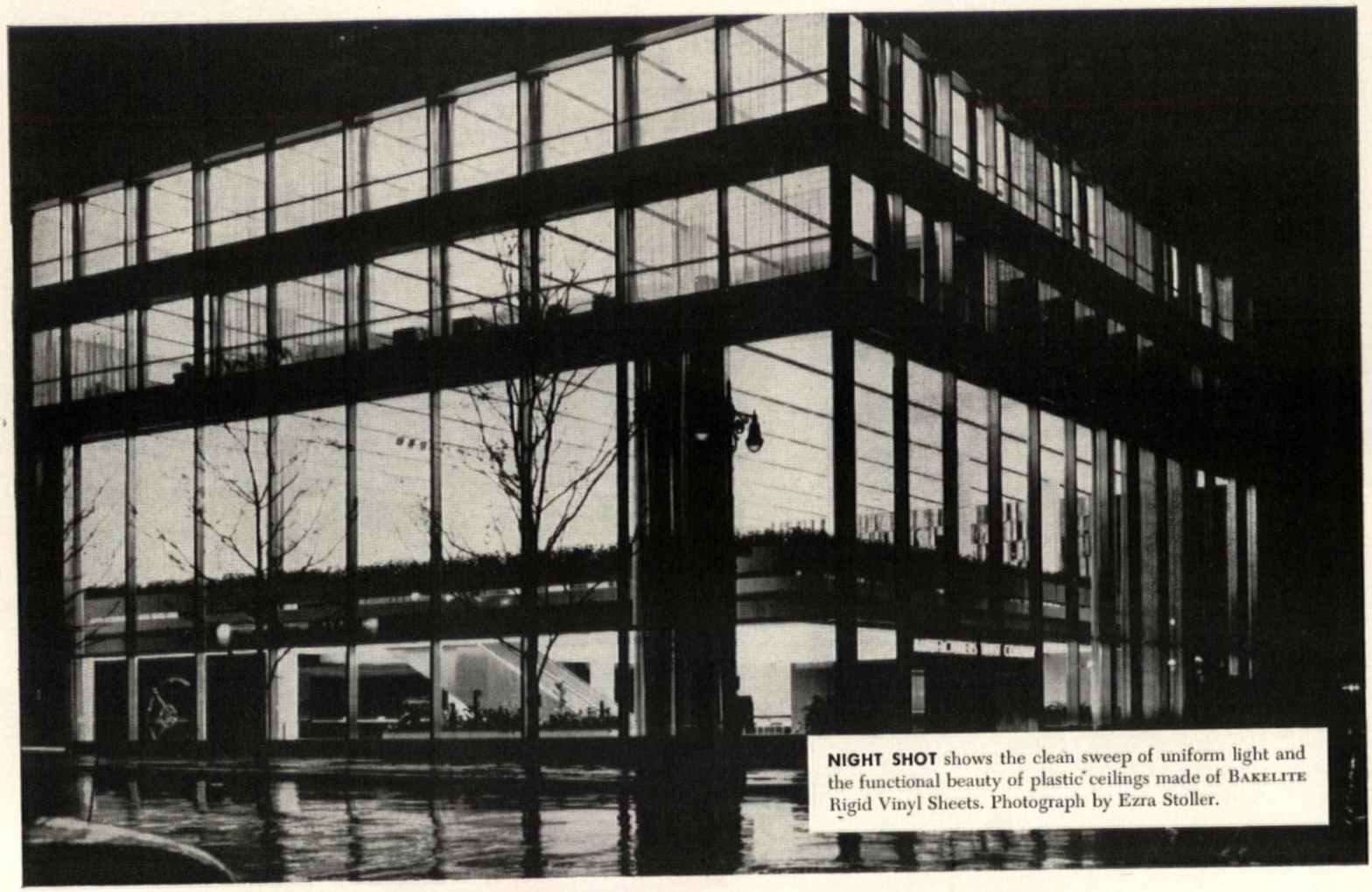


NIGHT SHOT shows the clean sweep of uniform light and the functional beauty of plastic ceilings made of BAKELITE Rigid Vinyl Sheets. Photograph by Ezra Stoller.

Bright, Clean and Spacious

That's the feeling of the ultra-modern Fifth Avenue office of Manufacturers Trust Company in New York.* To accent this mood, a plastic ceiling covers the entire business floor space with a brilliant canopy of shadowless light.

The ceiling consists of corrugated, milk-white panels of BAKELITE Rigid Vinyl Sheets resting on an aluminum frame. Light comes from long fluorescent tubes behind the panels. The ceiling provides a broad sweep of light and at the same time conceals pipes, ducts and structural projections.

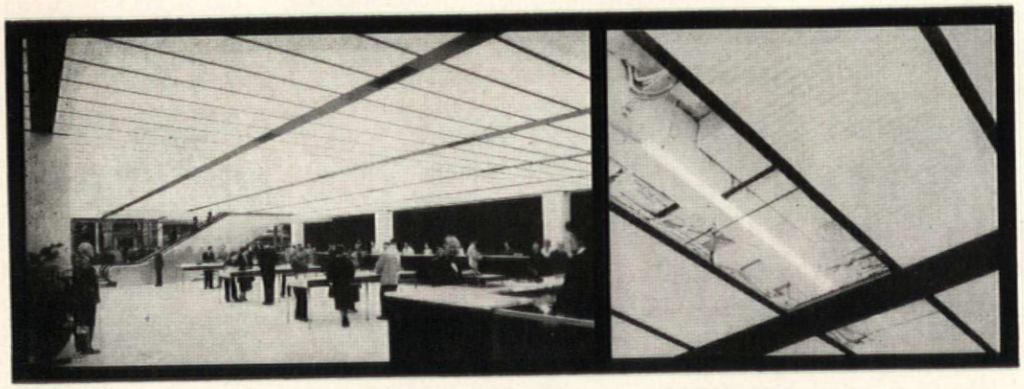
These thin panels roll up for easy access to light fixtures and air conditioning ducts. And they don't hinder sprinkler systems. They soften and fall at critical temperature.

BAKELITE Rigid Vinyl Sheets resist warping, cracking or discoloration with age. They can be safely washed with soap and water. They resist soil and grease and are dimensionally stable. Sound absorbent pads fastened to their support rails provide excellent acoustical conditioning.

For screens, signs, lampshades and scores of other products, BAKELITE Rigid Vinyl Sheets offer you many unique advantages. Learn more about these modern materials. Write to Dept. AO-14.

Ceilings made of BAKELITE Rigid Vinyl Sheets by **Marlux Corporation,** 346 Somerville Avenue, Somerville, Mass.

**Designed by Skidmore, Owings & Merrill, New York*



SHADOWLESS BRILLIANCE on the business floor space results from the excellent light transmission qualities of milk-white BAKELITE Rigid Vinyl Sheets.

CEILING CLOSEUP shows how plastic panels conceal wiring, ducts and lighting fixtures. Panels are instantly removable for cleaning or maintenance.

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RIGID VINYL SHEETS

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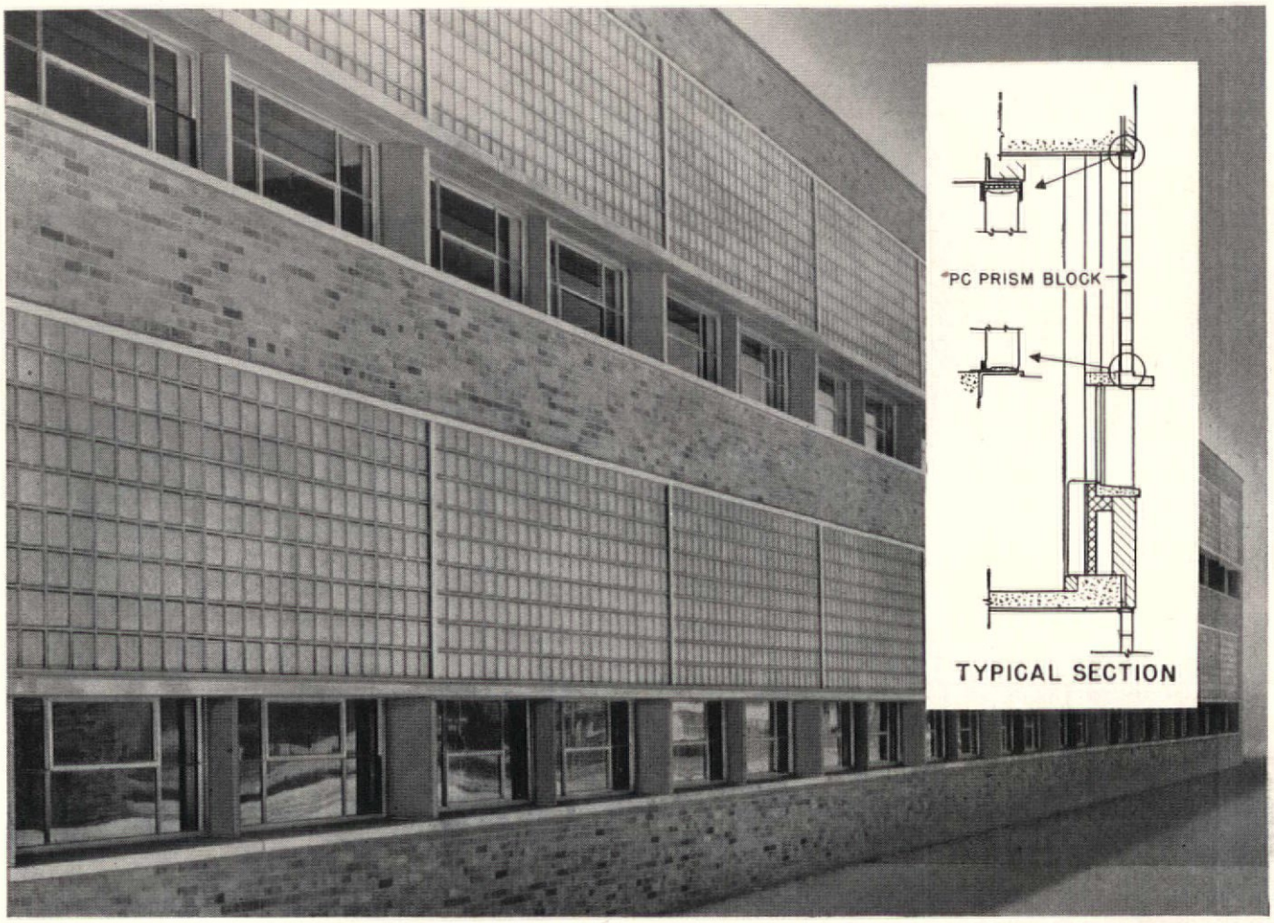


Edward Everett Elementary School, Detroit, Mich.

Architect: Giffels & Vallet, Inc., L. Rossetti, Associated Engineers and Architects, Detroit.

freedom of design with PC Glass Blocks

Any building material, improperly used, can create a dull and uninspired result, whether it be brick, stone or glass blocks. The essential ingredient in any design is the imagination of the architect. And, in the case of glass blocks, this need be the *only* limiting factor.

You don't have to protect a glass block panel against sunlight and the weather—and thereby spoil the function and appearance. You don't have to clutter the facade with overhangs – functional glass blocks have built in daylighting control. Your client will not be concerned with maintenance problems—glass blocks require no maintenance.

The school building in the picture is an interesting example of imaginative design. Notice the neat flush panels of PC Glass Blocks. Then notice the deeply recessed vision strips that are self-shading for high sun angles. The total effect is striking!

In the last few years, the PC Glass Block line has been expanded until you can now choose a block for every conceivable application. You can think in terms of the new 12″ blocks, the new Skytrol Blocks for toplighting, or the new Suntrol Blocks for high brightness areas. The product is here. Why not think seriously about it when planning your next new building? See our catalog in Sweet's or write Pittsburgh Corning Corporation, Dept. E-15, One Gateway Center, Pittsburgh 22, Pa.

PC Glass Blocks

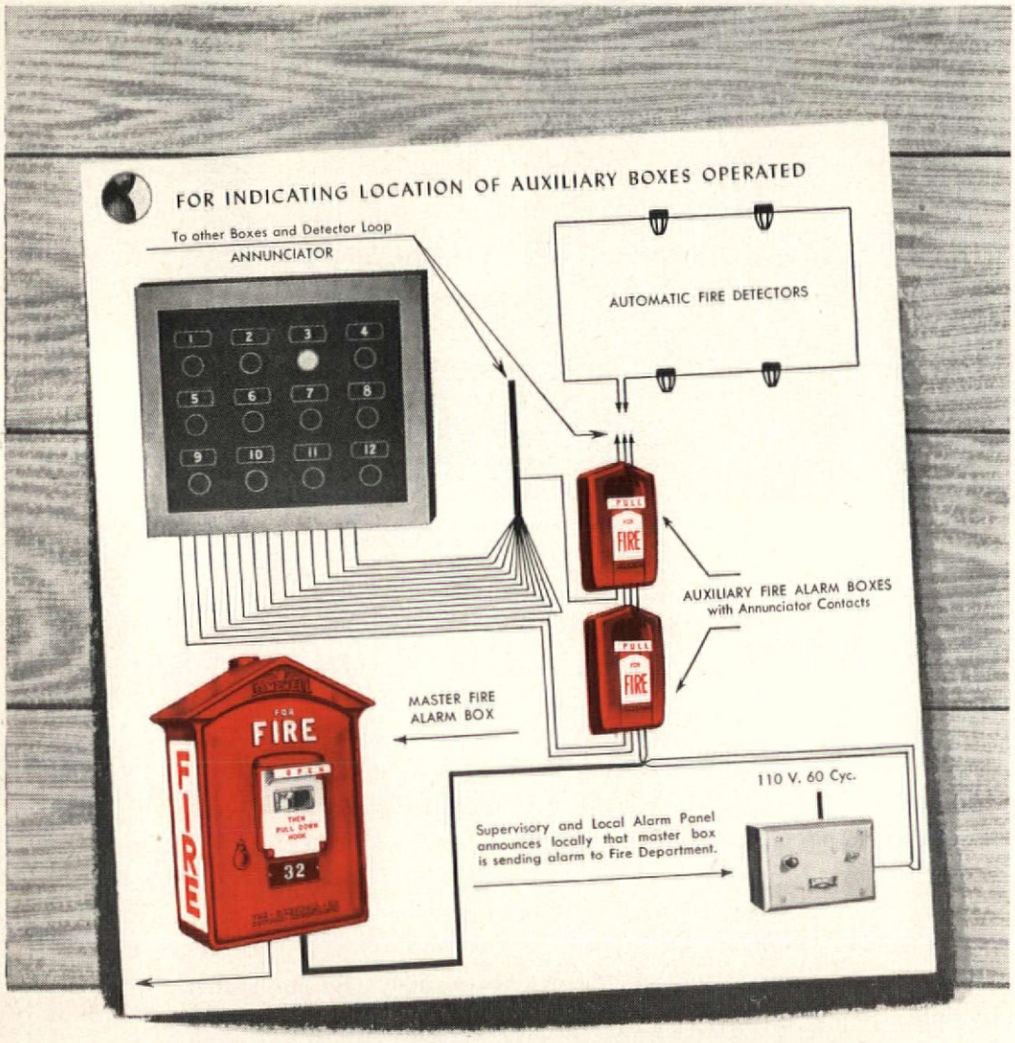
PITTSBURGH PC CORNING ®

ALSO SKYTROL® AND FOAMGLAS®

PRODUCTS

Continued from p. 190

from a ledge molded on the inside rim of the dome into a copper trough, where it evaporates. According to the manufacturer, the trough can take care of all but the soggiest conditions; for these a small drain may be run into interior plumbing. (For another solution to the problem of condensate disposal, see the *Dubl Dome* below.) The domes are low in silhouette and produce a wider spread of daylight than units set up on tiaras over the same size openings. Also, the interior fascia beneath AP squares can be configured in any fashion—round, square, oval or sloped. (For the purist who wants roundness throughout in his bubbles, AP also makes circular domes which install for little more than rectangles.) AP acrylic skylights are produced in stock sizes for use with conventional frame openings. Prices range from $30 for a 16" colorless square up to $225 for a 4′ x 6′. Translucent acrylic domes are slightly higher, but AP is planning to make translucent white domes of reinforced polyester, which could be priced much lower than acrylic. *Manufacturer:* Architectural Plastics, Inc., 20 Fitch St., E. Norwalk, Conn.



Connects Buildings Directly with the Municipal Fire Department

Wherever life or property should be safeguarded against fire, this Gamewell system gives reliable 24-hour daily service.

Alarms may be transmitted manually, or automatically by fire detectors. Thus, even when buildings are unoccupied, they are at all times connected directly with the Municipal Fire Department.

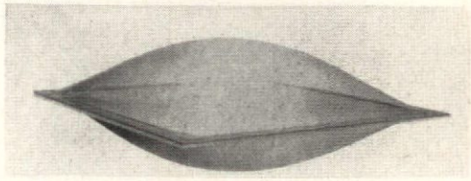
Write for additional information about Gamewell Auxiliary Fire Alarm Systems.

GAMEWELL®

THE GAMEWELL COMPANY
Newton Upper Falls 64, Mass.

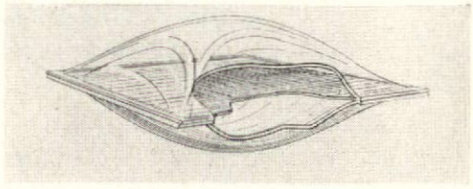
THE BOX IS POSITIVE

Reduces Human Error



AIRLESS BUBBLE sidesteps moisture trouble

Dubl-Dome, the hard plastic pillow (shown above) completely eliminates the usual skylight problem of condensate disposal by avoiding inside-moisture formation altogether. The vacuum-insulated unit is actually a triple walled shell—a flat center sheet fused to edges of top and bottom



halves serves as tension member. Its rigidizing center layer is engineered to compensate compressive force of the concave and convex domes and so stabilize the form of the unit regardless of quick weather change or indoor-outdoor differences. Developed in the cold Oregon clime, *Dubl-Dome* has a heat transfer coefficient one fifth that of single domes.

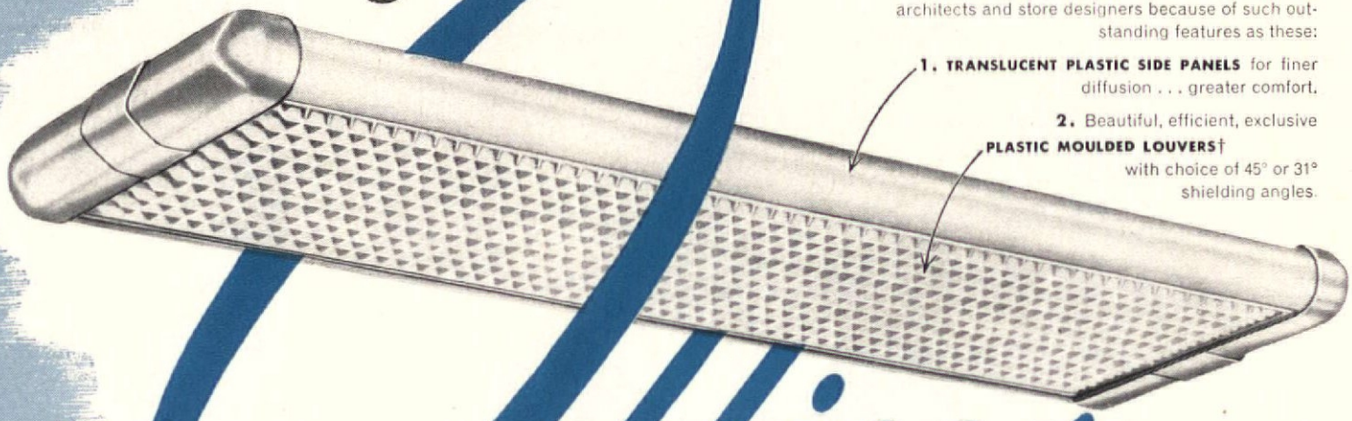
Shipped ready for placement over a simple curb, the skylight comes with a ductless gasket and stainless steel retaining rail. The gasket, made of cork and neoprene, is adhered to the top of the curb as cushion for the dome which is merely rested on the ledge. No drain or gutter is necessary. Rail lengths are precut and predrilled for nailing with spacing washers factory-attached. The price scale runs about 25% more than for single layer domes: a 2′-square *Dubl-Dome* lists at $55 F.O.B. (shipping weight 13 lb.) and a 4′ x 6′ (115 lb.) is $220. Various combinations of clear and transparent acrylic may be obtained as well as tinted plastic.

Because no condensate can form inside the *Dubl-Dome*, units may be installed on roofs with slopes up to 30%. *Manufacturer:* Bettcher Plastics Co., 1616 N. W. Gisan St., Portland, Ore.

continued on p. 198

a Beauty Winner of the Benjamin Leader Line...

the Officer



FOR STORE, SCHOOL AND OFFICE LIGHTING . . . THE OFFICER SERIES . . . Outstanding installations throughout the U. S. prove it the favorite choice of leading architects and store designers because of such outstanding features as these:

1. TRANSLUCENT PLASTIC SIDE PANELS for finer diffusion . . . greater comfort.

2. Beautiful, efficient, exclusive **PLASTIC MOULDED LOUVERS†** with choice of 45° or 31° shielding angles.

for Interiors of Distinction

Distinctive . . . years-ahead styling . . . Yes, you have only to see the Officer in operation to appreciate its outstanding beauty . . . its harmony of line which fits it for every interior of distinction.

Distinctive, too, in its years-ahead versatility, the Officer Series has the adaptability to fit it to every lighting need . . . to special room arrangements . . . to special spot effects.

Yes, in Beauty . . . in Versatility . . . and in Constructional Advancements . . . on every count the Officer is a Beauty Winner!

Write for complete catalog data sheets today.

The Officer is available for 2, 3, or 4 fluorescent lamps in regular 40 watt or Slimline in 48", 72" and 96" lengths.

BENJAMIN *Leader Line*

Sold Exclusively through Electrical Distributors

Exclusive Licensee of the Leader Line in Canada: Robertson Irwin Limited, Hamilton, Ohio

Leader Division of Benjamin Electric Manufacturing Company, Dept. YY, Des Plaines, Illinois . . . makers of famous Benjamin and Leader Line lighting equipment and sound signals for Industry, Institutions and Commerce.

B-272R

"It's a wall with a window

That's Truscon's Vision Vent!"

Vision-Vent is Truscon's new wall panel that incorporates all the mass production and installation economies of standard steel windows. Each unit is complete, with fixed lights and insulated steel panel. Window openings may be awning-type ventilators or Truscon Double-Hung Steel Windows. Elements can be varied to meet specific requirements.

Weathertight Vision-Vent panels are designed to cover entire wall surfaces. Erection is done from inside, and can average a floor-a-day rate.

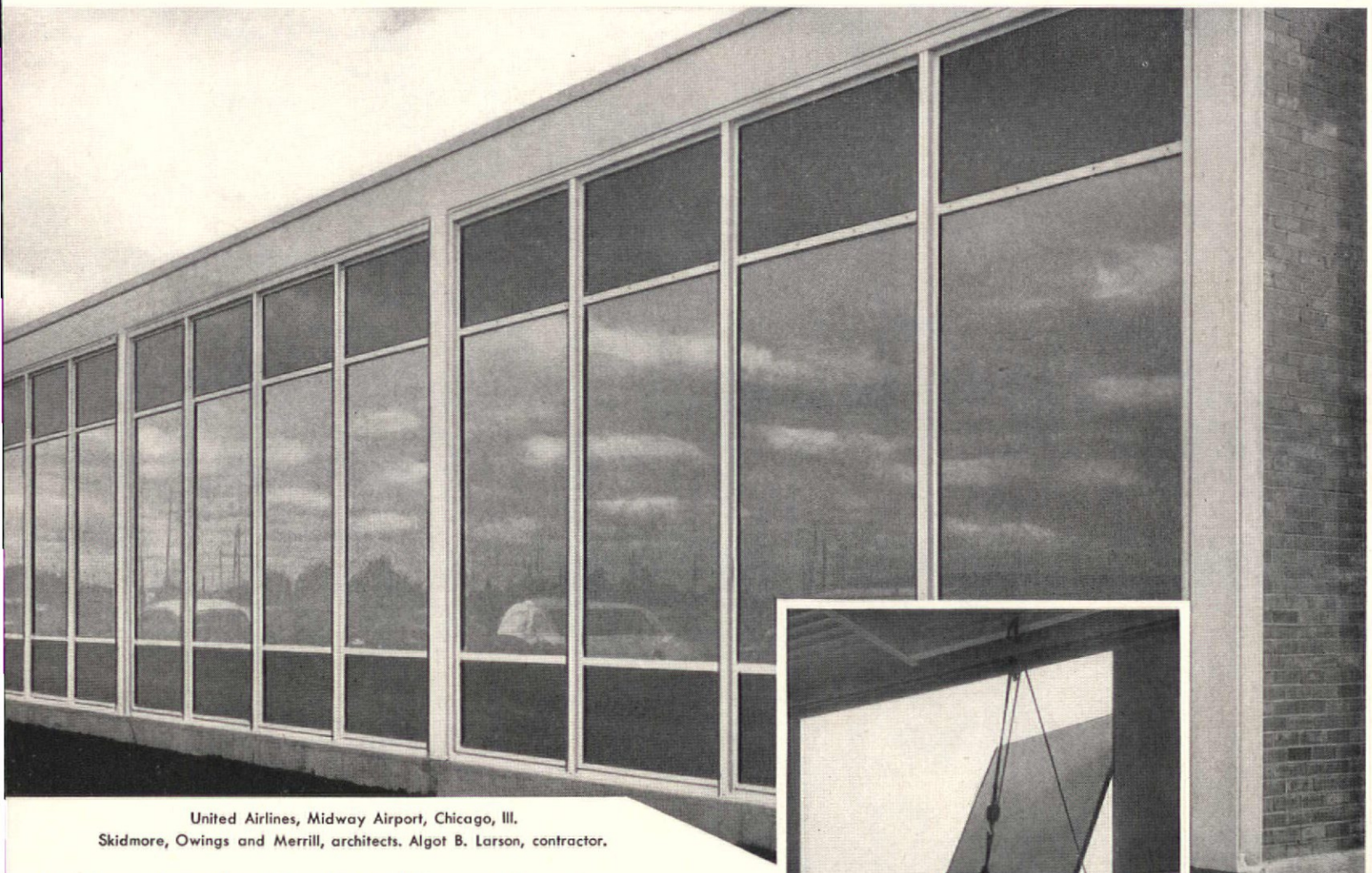
REPUBLIC

World's Widest Range of Standard

SPECIFY TRUSCON STEEL JOISTS, ROOFDECK... ELECTRUNITE E. M. T. FOR FIRE RESISTANCE

Truscon "O-T"® Steel Joists assure you lightweight, strength, and fire resistance in floors and roof construction. Truscon Ferrobord® Steeldeck is easy to handle, easy to place. It comes in lengths that span three or more purlins. It roofs large areas quickly. Exclusive design allows full-length interlocking, greater strength.

ELECTRUNITE® Electrical Metallic Tubing is Republic's lightweight, rigid steel raceway that protects wiring circuits against fire, moisture, and mechanical injury. Inspected by Underwriters' Laboratories. Approved by National Electrical Code for exposed, concealed, or concrete slab construction. Exclusive "Inch-Marked"® feature means installation saving.



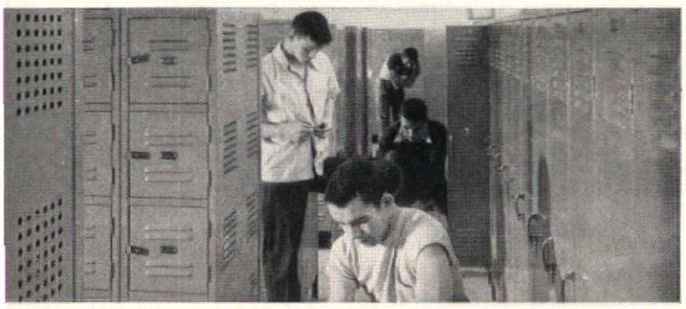
United Airlines, Midway Airport, Chicago, Ill.
Skidmore, Owings and Merrill, architects. Algot B. Larson, contractor.

Insulated panels may be colored porcelain enamel or stainless steel. "U" factor is equivalent to that of an ordinary masonry spandrel wall. They retain interior heat. They provide for efficient air conditioning.

Several dozens of new Vision-Vent applications have been engineered to provide simplicity of design, weather resistance, low initial cost, low maintenance cost. You'll be interested in the details. Write Republic's Truscon Steel Division, Youngstown 1, Ohio.

STEEL

Steels and Steel Products



Wherever clothing is changed or stored, Berger Steel Lockers are first choice. Republic's Berger Division is the world's leading producer of standard and special purpose lockers — including exclusive handle-free "Key-Control" lockers. The key is the handle to assure full-time locked protection. Look to Berger for planning, engineering and installing locker systems.

REPUBLIC STEEL CORPORATION
3108 E. 45th Street
Cleveland 27, Ohio

REPUBLIC STEEL

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☐ Truscon Vision-Vent Walls
☐ Truscon "O-T" Steel Joists
☐ Truscon Ferrobord Roofdeck
☐ Electrunite E. M. T.
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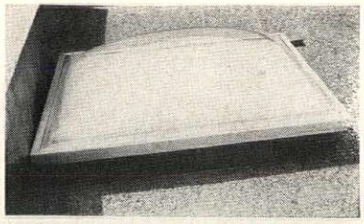
Address_____

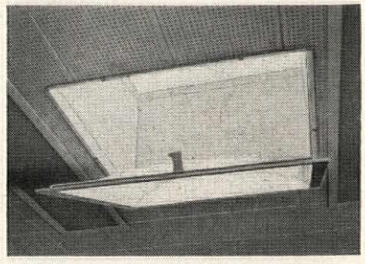
City_____ Zone____ State_____

K-7513

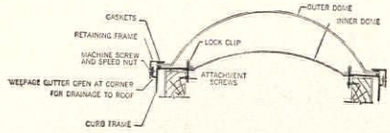
PRODUCTS

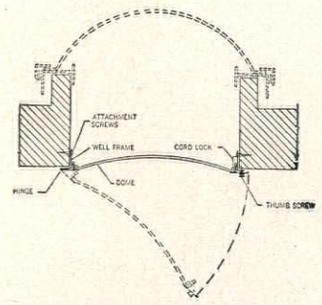
Continued from p. 194

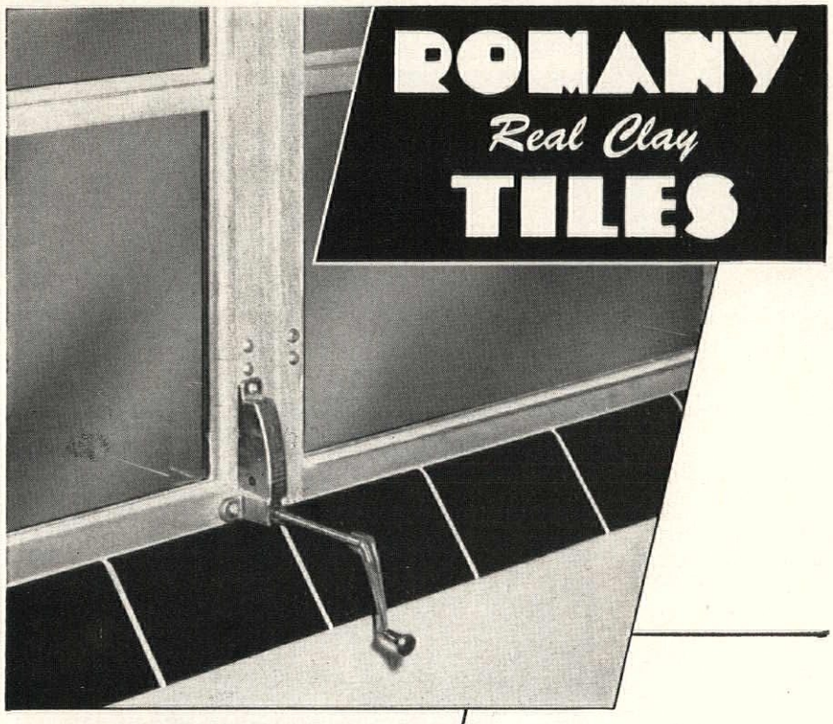




Extra insulation is provided by skylights with two plastic layers or regular unit with flush-to-ceiling shallow dome.

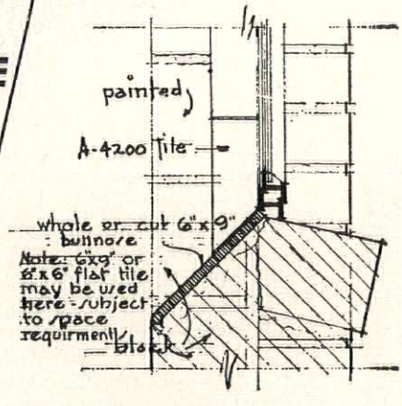






SLOPING WINDOW SILL TILE

Especially in schools, there is a growing preference for sloping window sills where nothing can be collected—including dust. ROMANY 6"x9" bullnose or flat tile may be cut to perfectly connect window sill with wall surface below. Bullnose tile may be turned into the plaster or wall surface, or into the window. ROMANY A-4200 cap is of real assistance for both jambs. These units are available in all Buff Body colors.



Every Architect should have our Sample Tile Chart No. 6. It's free.

UNITED STATES QUARRY TILE CO

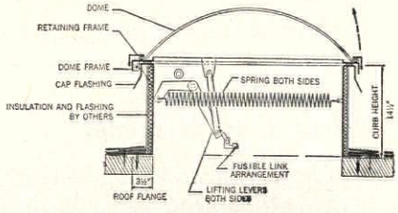
Member: Tile Council of America and Producers' Council, Inc.

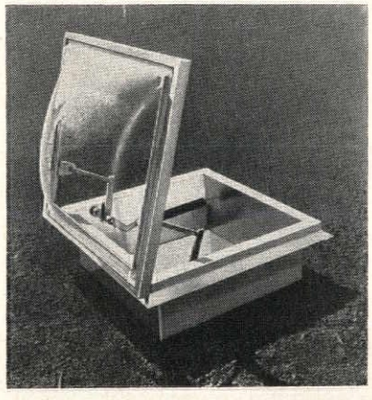
217-J FOURTH ST., N.E., CANTON 2, OHIO

PLASTIC SKYLIGHTS are designed for a wide variety of purposes

Wasco's current crop of acrylic toplights do more than just sit on a roof and let in light. Some open up for air; one doubles as a hatch door; and another literally blows its top under pressure.

The *Ventdome* (AF, Jan. '53), designed for use over lavatories, halls and utility rooms, provides controlled ventilation via motor-driven fan (or fans) built into its curb assembly. The *Airdome,* furnished with removable screen, is opened manually to catch the breeze. The *Pyrodome* pops open in case of fire to let smoke and fumes





escape. A modification of this, the *Pyrovent,* substitutes a flat insulated aluminum panel for the convex acrylic. In laboratories or factories where explosions are a danger, the specially mounted *Pressure Relief Domes* give vent to abnormal pressure. A *Hatchway* model lifts up for access to the roof. If more insulation or a flush ceiling effect is wanted, the shallow curved *Ceiling Dome* placed at the bottom of the well will give it. Another insulating unit, the *Double Dome,* has two plastic layers separated by air space.

The mechanical aptitudes displayed by the skylight group have economic as well as design value: many practical architec-

continued on p. 202

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HOME BUILDERS' SHOW
(Booths 49, 50, 51, 52 — CONRAD HILTON)
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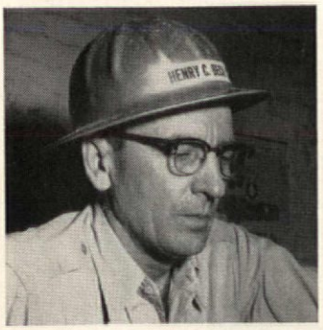
Who stands behind your doors?

IF they're Mengel Doors, your worries are over. Every Mengel Door is built to meet or exceed the most rigid specifications — is *guaranteed* in accordance with the Warranty of the National Woodwork Manufacturers Association — is backed by Mengel's long years of experience and "know-how" in the manufacture of doors. *Mengel is the world's largest manufacturer of hardwood products* — including Mengel Permanized Furniture and Mengel Kitchen Cabinets.

These fine, *guaranteed* doors are available in three different types, for *every* kind of job — "Palace or Project". Each is an outstanding value, and is competitively priced. Write for complete information — AIA File No. 19-E-1.

Door Department
THE MENGEL COMPANY
Louisville 1, Kentucky



Job Superintendent

FRANK MARONEY says, "Cofar eliminates the need of temporary decking. In only two days 6 men can place a 20,000 sq. ft. Cofar floor. Because placing and welding are quick, Cofar saves on labor costs."

Architect's Representative

AL CADENHEAD says, "Using Cofar not only saves labor and enables us to place concrete faster, it provides a rigid floor deck with minimum of shoring. Cofar also makes a savings of slab reinforcing rods possible."

Contractor's Representative

J. B. HUTCHISON says, "Cofar floors are placed right behind bolting crews *twice* as fast as conventional floors. By eliminating a set of planking, Cofar is a less costly way to construct multi-story buildings."

DESIGN-BUILDER TEAM USES COFAR IN NEW ATLANTA SKYSCRAPER

Saves 11 weeks in pouring and finishing time

Cofar eliminates slow steps in erection, speeds placement of floors, saves $25,000 in temporary shoring alone!

ATLANTA, GEORGIA—Sharply highlighting this Dixie City's booming expansion program, the Fulton National Bank Building today races on schedule toward its mid-1955 completion date. Atlanta's tallest building—rising 25 floors above ground, with 3 more below ground for parking — is also Atlanta's most modern structure. Bulky, expensive wood forms have been completely eliminated through the application of clean, fast Cofar construction!

Cofar deep-corrugated steel units (with transverse wires welded across corrugations) arrive at Atlanta pre-cut to fit the Fulton building frame. Following immediately behind the bolters, construction crews place and weld each 30 sq. ft. Cofar unit into position. Cofar serves as both form and reinforcement for concrete slabs, an immediate working platform for plumbing, electrical and other trades, and provides all the positive and temperature-reinforcing steel needed in the structural concrete slab.

Says J. B. Hutchison, vice-president of Henry C. Beck Co., contractors, "By eliminating planking, alone, Cofar saves

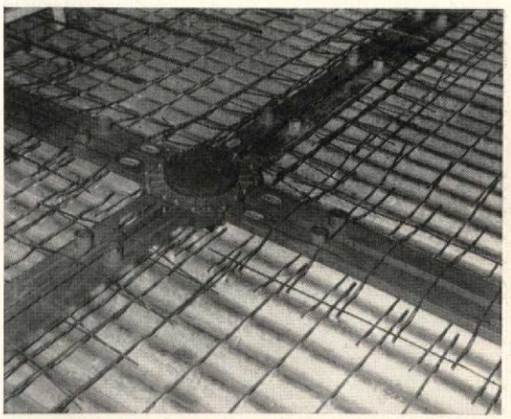
ON THE JOB PHOTOS:

Placed In Seconds

Cofar units, conveniently bundled for individual bays, are unloaded at a railroad spur 3 blocks from the Fulton Building project. Cofar is quickly placed and welded into position, ready *days* ahead of conventional forms for concrete crews to move in and begin pouring the slab.

Eliminates Wood Forms

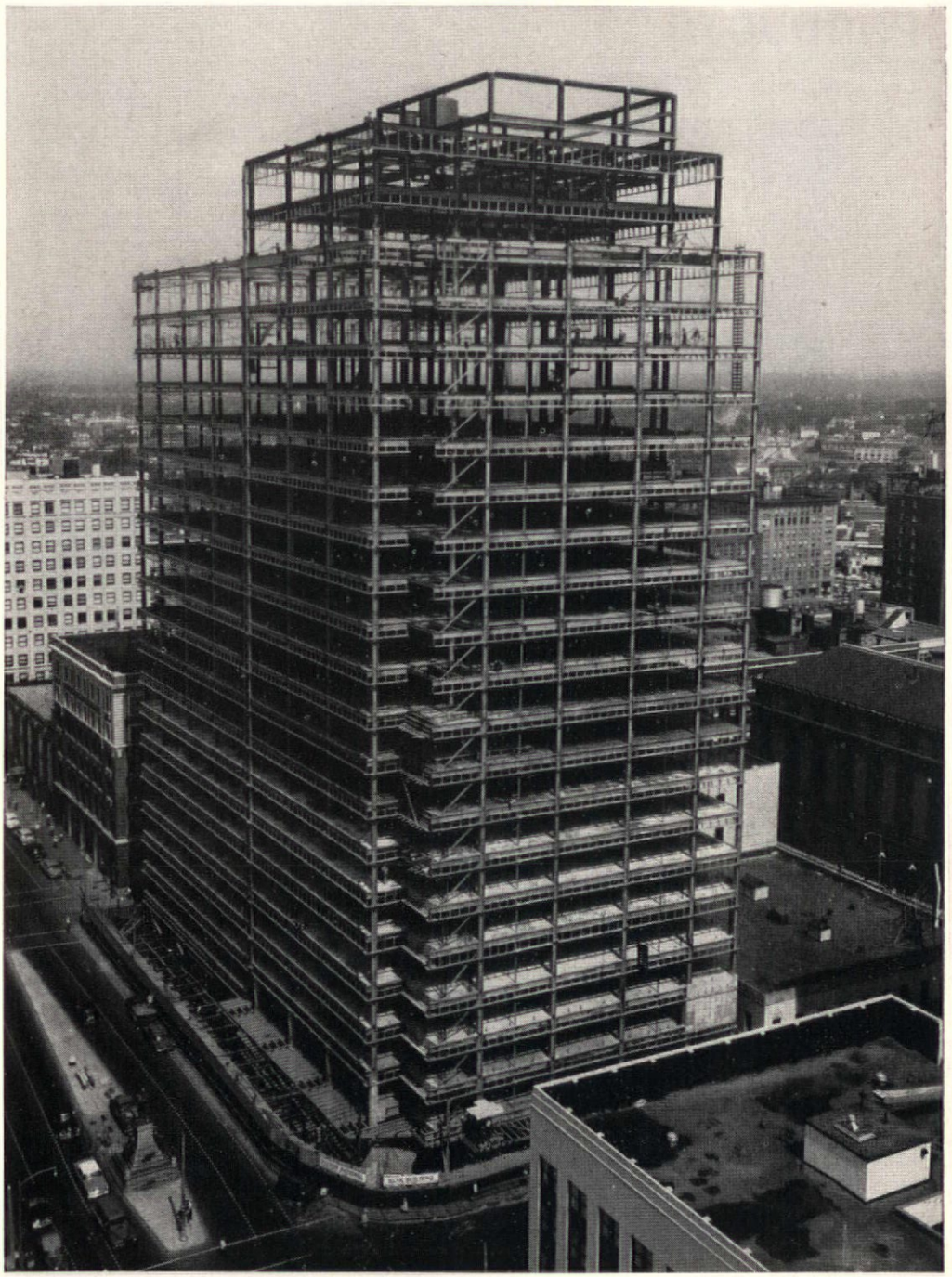
Once the Cofar units are placed they form a safe, solid working deck for all trades. The tight lap between sheets holds the wet concrete—result: an ideal incombustible steel form that does double duty. *When the concrete sets the steel becomes positive reinforcement for the slab.*



Underfloor Electrical Flexibility

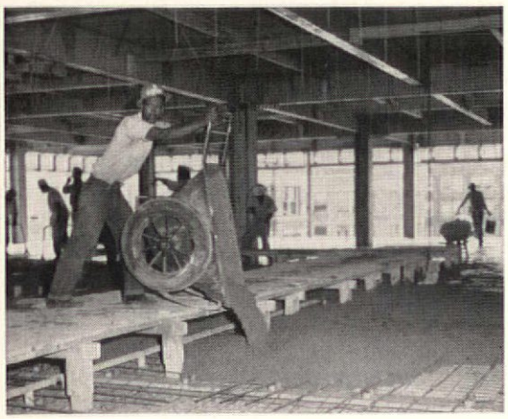
To provide complete electrical and communications flexibility, underfloor ducts are cast in the structural slab. With outlets every 2 feet along the duct, office equipment and desks always fall over an outlet. Result: complete flexibility, economy but no sacrifice of high strength floors.

The Fulton National Bank Building
Architect-Engineer: *Wyatt C. Hedrick, Dallas Texas*
Associate Architect: *Moscowitz, Willnen & Millkey, Atlanta, Georgia*
Contractor: *Henry C. Beck Co., Dallas & Altanta*



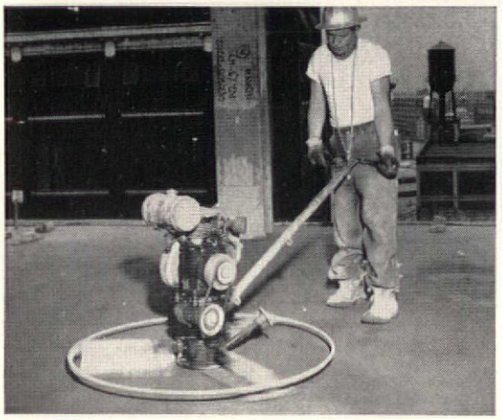
us $25,000 on this job. We place 55,000 square feet or 2½ floors of Cofar a week. By conventional methods, we'd be lucky to complete a floor a week!"

Cofar makes concrete floor and roof construction a one-stage operation, saves weeks in building time, and insures faster occupancy of the completed building. For information, estimates or costs on *your* building project, contact home or district office, attention Dept. F-1.



16¼ Floors In 37 Days

Despite a 2 month work stoppage, Cofar construction helped make up lost time. After work began again, concrete crews poured 16¼ floors in 37 working days—a gross area of 345,500 sq. ft. It would have taken more than twice as long using conventional forms.



Safe, High-Strength Construction

Suited to steel or concrete frame, Cofar monolithic slabs provide complete plate action for concentrated loads and horizontal forces. Attractive underside of Cofar units can be, and often are, used as exposed ceiling. Cofar is widely accepted for use by regional building codes.

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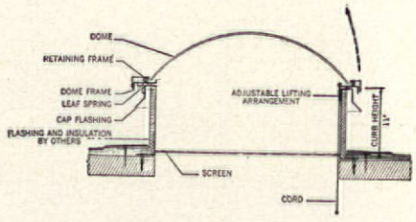
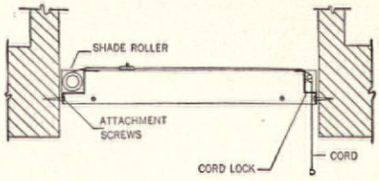
PRODUCTS

Continued from p. 198

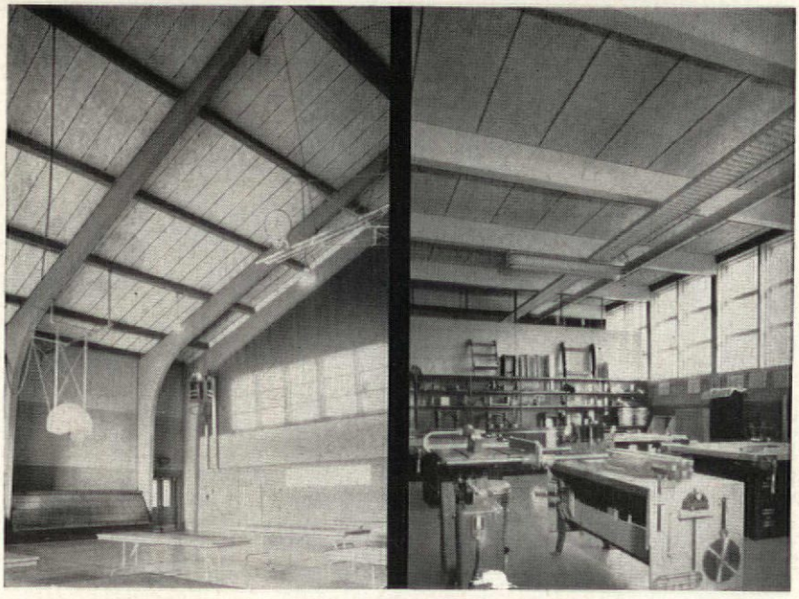


Lifting up for access to roof, the ***hatchway*** skylight does double duty. Drawing (above) is the ***airdome*** which responds to tug on pull cord by opening up for ventilation.

tural functions can be integrated in a top-lighting scheme for a school, hospital or plant without disrupting the pattern or bringing in extra roof elements. Like regular *Skydomes*, the new square and rectangular units come in clear and translucent plastic, many with prefab curbs. All have gutters which channel condensate and weepage out to the roof, and all allow the highly expensive acrylic domes free movement by perching them in neoprene gaskets between retaining frame and curb. Where transmission of vitamin D to schoolchildren, invalids or indoor greenery is considered more important than prevention of fabric fading, domes can be ordered with a plastic that lets through ultraviolet.



An accessory to Wasco's new line that will be especially useful in classrooms used for slide films and movies is the *Skyshade*. Mounted beneath a dome, it will, on occasion, act as horizontal veil for daylight.
Manufacturer: Wasco Flashing Co., 87 Fawcett St., Cambridge 38, Mass.



Junior High School, Keene, New Hampshire
3¼" Composite Porex
Architect: J. A. Britton
Gen. Contractor: MacMillan Co.

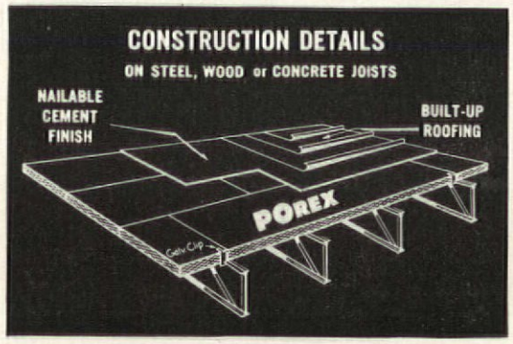
POREX ACOUSTICAL CEILINGS

Heat Insulation, Sound Control and Fire Protection ...all in one ROOF DECK!

When roof decks must provide maximum quality at minimum cost, architect after architect specifies POREX . . . because POREX combines all these properties:

- **STRUCTURAL STRENGTH**
- **LIGHT WEIGHT**
- **NAILABILITY**
- **INCOMBUSTIBILITY**
- **HEAT INSULATION**
- **SOUND CONTROL**

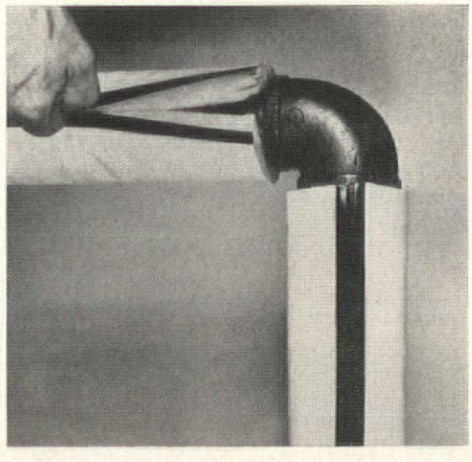
Plain POREX for short spans and Composite POREX for long spans are also ideal for Auditoriums, Gymnasiums, Armories, Churches, Factories and many others.



SAFE UNIFORM LOADS

Type of POREX	Thickness Slab	Thickness Finish	Weight lbs/ Sq. ft.	Safe loads lbs/ sq. ft. span 1'4"	2'8"	3'4"	6	8'
Plain	2"	¼"	7	100	60	—	—	—
Plain	3"	¼"	10	—	90	50	—	—
Composite	3"	¼"	14	—	—	—	100	60

POREX MANUFACTURING CO., North Arlington, N.J.
Precast lightweight concrete products since 1920



ZIP-ON PIPE COVER is airtight, watertight plastic sheath

Precut to exact size, *Proteksinsul* plastic sheath for insulated pipes zips in place by means of a polyvinyl closure electronically welded to the flexible sheeting. Made of moistureproof polyvinyl chloride acetate film 12 mil thick, the integrally colored *Proteksinsul* is a neat garment to dress off exposed pipe. It will also bend around square ducts. Prices range from 25¢ per lin. ft. for covers for ½" insulated pipe up to $1.50 for 33" diameter.
Manufacturer: Miracle Adhesives Corp., 214 E. 53 St., New York 22, N.Y.

continued on p. 206

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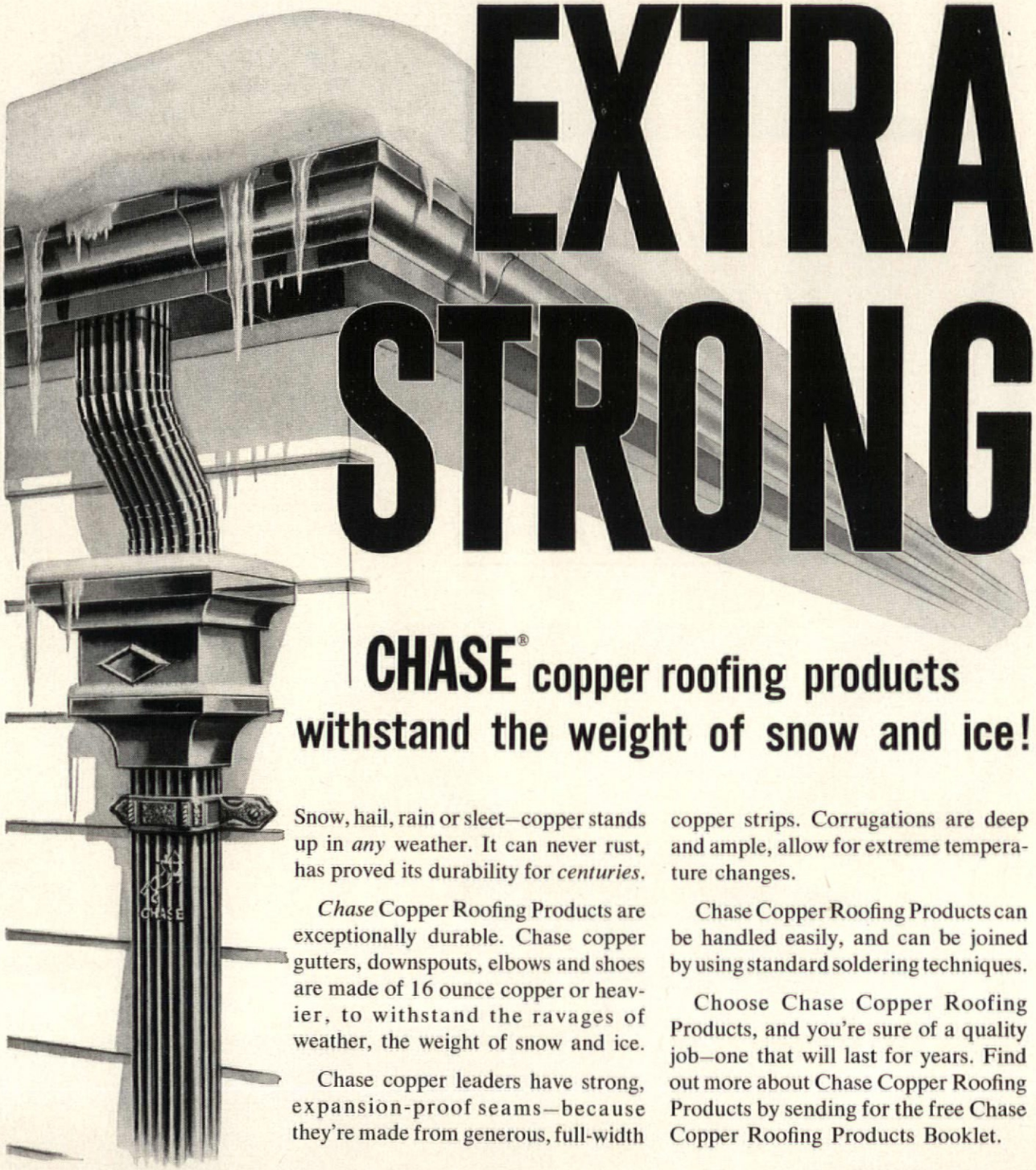


EXTRA STRONG

CHASE® copper roofing products withstand the weight of snow and ice!

Snow, hail, rain or sleet—copper stands up in *any* weather. It can never rust, has proved its durability for *centuries*.

Chase Copper Roofing Products are exceptionally durable. Chase copper gutters, downspouts, elbows and shoes are made of 16 ounce copper or heavier, to withstand the ravages of weather, the weight of snow and ice.

Chase copper leaders have strong, expansion-proof seams—because they're made from generous, full-width copper strips. Corrugations are deep and ample, allow for extreme temperature changes.

Chase Copper Roofing Products can be handled easily, and can be joined by using standard soldering techniques.

Choose Chase Copper Roofing Products, and you're sure of a quality job—one that will last for years. Find out more about Chase Copper Roofing Products by sending for the free Chase Copper Roofing Products Booklet.

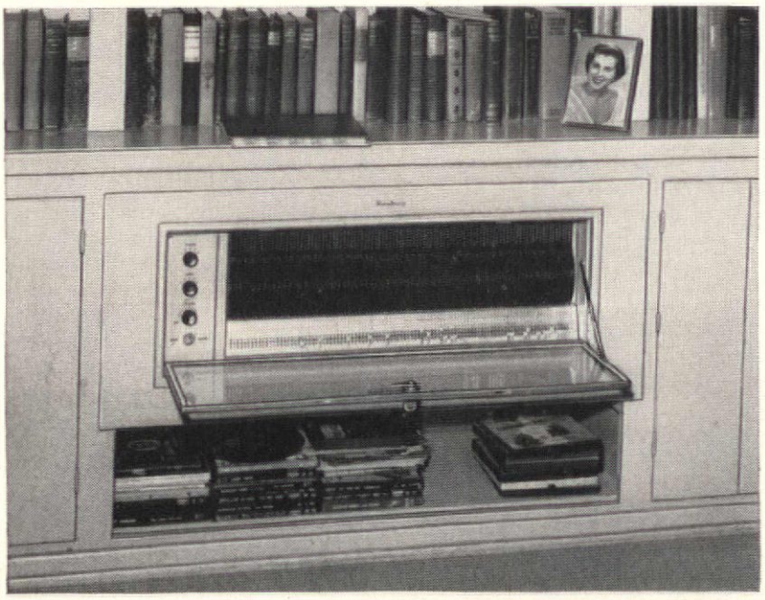
Chase®
BRASS & COPPER CO.

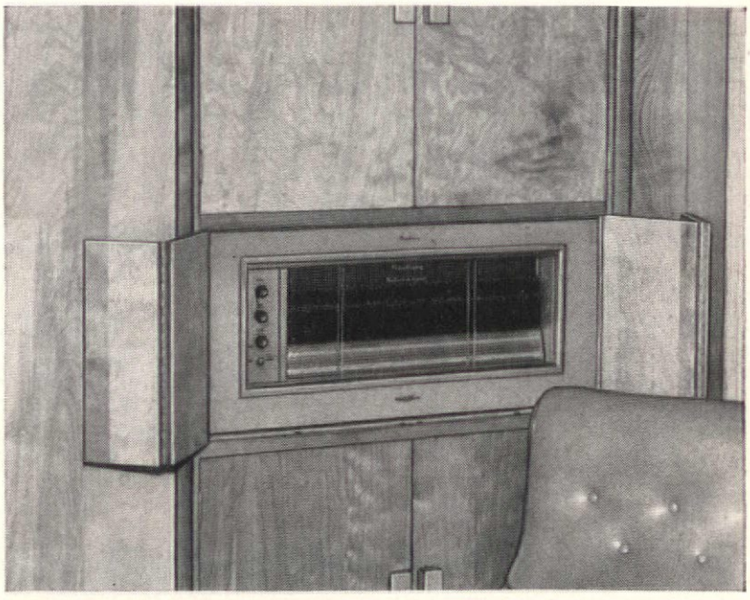
WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

Chase Copper adds extra value to any home!

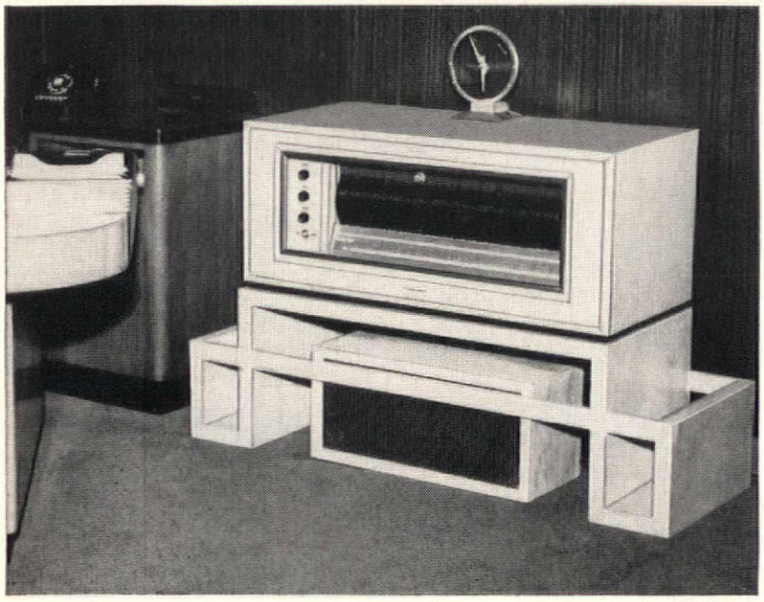
The Nation's Headquarters for Brass & Copper (†sales office only)

Albany †	Chicago	Denver	Indianapolis	Minneapolis	Philadelphia	St. Louis
Atlanta	Cincinnati	Detroit	Kansas City, Mo.	Newark	Pittsburgh	San Francisco
Baltimore	Cleveland	Grand Rapids †	Los Angeles	New Orleans	Providence	Seattle
Boston	Dallas	Houston	Milwaukee	New York	Rochester†	Waterbury





The Seeburg Custom Unit for built-in installations.



The Seeburg Library Unit.

The Seeburg Console.

New note for architects . . . Seeburg Music!

For Homes, Apartments, Hotels, Clubs. Add a new note . . . Seeburg music . . . to your plans. The Seeburg Select-O-Matic that holds 100 records, plays up to 400 selections of 45 RPM music (E.P. records), is the perfect answer for selective listening pleasure. Programs are automatically arranged at the touch of a finger . . . no handling records or fussing with albums.

For Business and Industry. Whether it's a factory or bank . . . an office building or shopping center . . . a showroom or an institution, Seeburg will work with you and your client to bring the acknowledged benefits of music to his business. For this purpose Seeburg has developed a work and atmosphere music library specifically designed for industrial and commercial use.

Write. There's a Seeburg Distributor near you who would like to tell you all about Seeburg High Fidelity Music Systems, the new Seeburg Music Library and the revolutionary Seeburg Plan.

Seeburg Background Music Library. Work and atmosphere music. Monthly refresher service. Manufactured for Seeburg by RCA-Victor Custom Record Division.

WORK AND ATMOSPHERE

SEEBURG
Background Music Service

J. P. Seeburg Corporation, Chicago 22, Illinois

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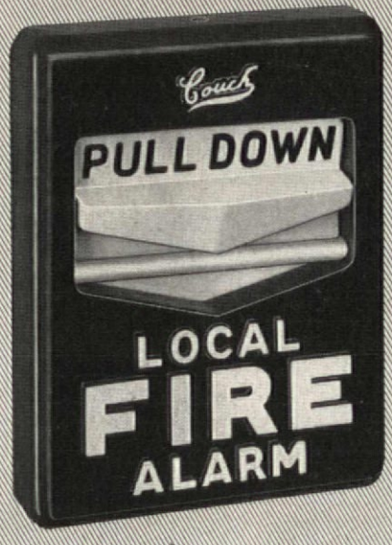
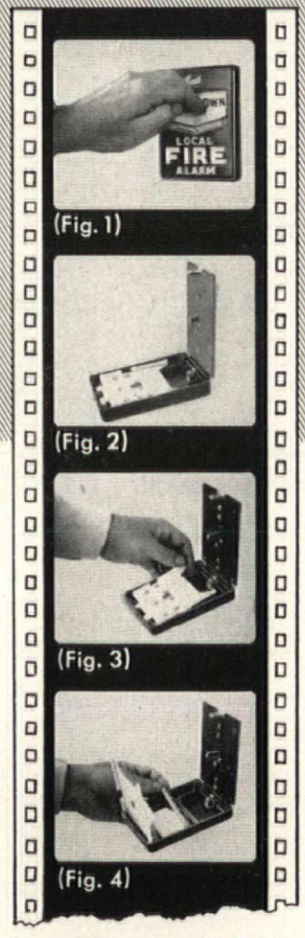
PRODUCTS

Continued from p. 202

NEW MODERN DESIGN

and SIMPLE OPERATION





Couch NON-CODE FIRE ALARM STATION

Here is an all new non-code UL approved fire alarm station for use in all types of buildings. Clean and simple in appearance, this station provides complete dependability of operation. Its two-position locking mercury switch element provides positive contact when operated, but is not affected by shock or vibration. The element is hermetically sealed for protection against dirt and moisture.

The film strip at the right shows the ease with which the station is reset after use.

(Fig. 1) Station closed and about to be operated
(Fig. 2) Open station
(Fig. 3) Lift up sliding front panel
(Fig. 4) Replace glass rod (broken glass is self-clearing)

For complete details on this and other Couch fire alarm equipment write for Data Sheet FI

Simplified Systems of Communication

S. H. Couch Company, Inc.

Private telephones for home and office . . hospital signaling systems . . apartment house telephones and mail boxes . . . fire alarm systems for industrial plants and public buildings.

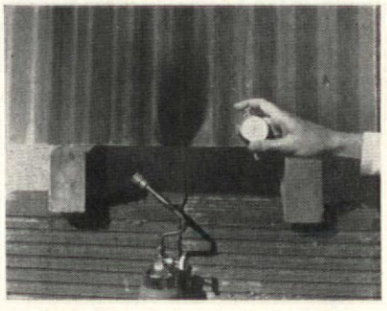
NORTH QUINCY 71, MASSACHUSETTS, U. S. A.
In Canada: Canadian Marconi Company, Montreal.

SELF-CURING POLYESTER plugs holes in cast-iron pipeline

Celanese has demonstrated an interesting maintenance use for its self-curing resin. About 40 lin. ft. of a miserably corroded water header at a Texas plant was restored to top performance by 30 gal. of polyester and four layers of woven glass. Although most of the pipe had rusted paper thin and 20 holes were below water level, repair was easy. Scale was knocked off and two plies of resin-saturated glass cloth applied over the holes. Leaks were plugged and two more saturated layers wound over the whole rusted area. The laminate, strong enough to carry a man over the erstwhile holes, will not rust or rot and its moisture-absorption is less than 5%. Neither the connections nor the pipe had to be removed, and so the total materials cost of $137.88 and few hours of labor could not have been matched by other replacement methods.

For skylight and glazing applications, *Celanese* has announced a *Marco* resin, *MR-28RC*, which it reports is 25% more translucent than others on the market. The new chemical can be supplied with a light-stabilizing additive. Still in the experimental stage is another polyester with the clarity of water which should be suited for many application requirements now met only by more costly acrylics.

Manufacturer: Celanese Corp. of America, 180 Madison Ave., New York 16, N. Y.



REINFORCED PLASTIC is slow burning

Fire-Snuf translucent light green sheet is suited for many school and industrial siding and skylight uses where flame resistance of materials must be considered. Having a flame-spread rating under 69 (.18" per minute), the corrugated, glass-fiber reinforced panel owes its slow-burning and self-extinguishing characteristics to the chemical *Hetron*. Addition of this "het acid" (a product of Hooker Chemical Co.) to the polyester resin and glass-fiber laminate does not materially affect its strength or translucency. *Fire-Snuf* sells for about $1.49 per sq. ft.

Another polyester development by the same manufacturer is a panel with widthwise corrugations. Planned for partitions and signs, the 12' x 3'-10" transverse sheet should eliminate piecing and seaming on many applications.

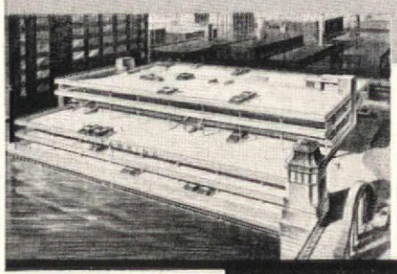
Manufacturer: Resolite Corp., Zelienople, Pa.

continued on p. 210

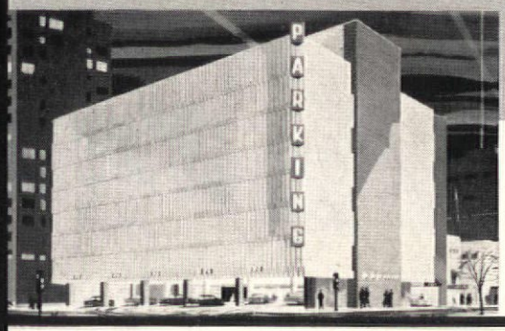
REINFORCED CONCRETE

chosen for CHICAGO's nine new parking garages

Each of the nine parking garages in Chicago's new $50,000,000 program to provide adequate parking facilities will be built of reinforced concrete. Every one of the nine architectural firms involved selected reinforced concrete. It provides greater economy, inherent fireproof qualities, weather resistance, design adaptability, attractive appearance, low maintenance costs, and availability of materials. On *your* next job, too . . . design for reinforced concrete.

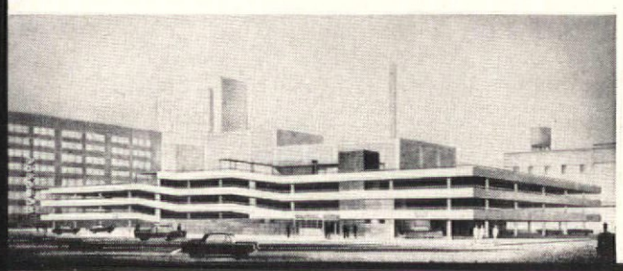


Graham, Anderson, Probst and White, Architects



Loebl, Schlossman and Bennett, Architects

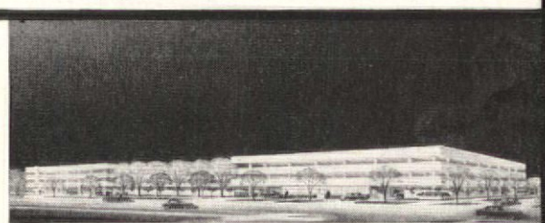
Shaw, Metz and Dolio, Architects



Everett F. Quinn and Associates, Architects

Schmidt, Garden and Erickson, Architects

Naess and Murphy, Architects



Holabird and Root and Burgee, Architects

Friedman, Alschuler and Sincere, Architects

McClurg, Shoemaker and McClurg, Architects

CONSULTING ENGINEERS:
De Leuw, Cather & Co.

CONCRETE REINFORCING STEEL INSTITUTE C.R.S.I. FOUNDED 1924

CHICAGO DEPARTMENT OF PUBLIC WORKS:
George Dement, Commissioner
Dick Van Gorp, Chief Engineer
M. J. Glicken, Architect

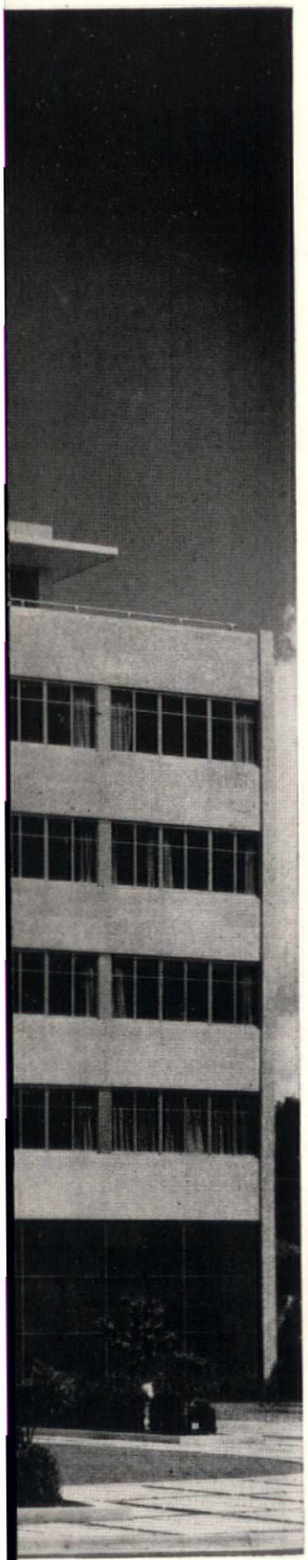
38 South Dearborn Street • Chicago 3, Illinois

CONCRETE REINFORCING STEEL INSTITUTE

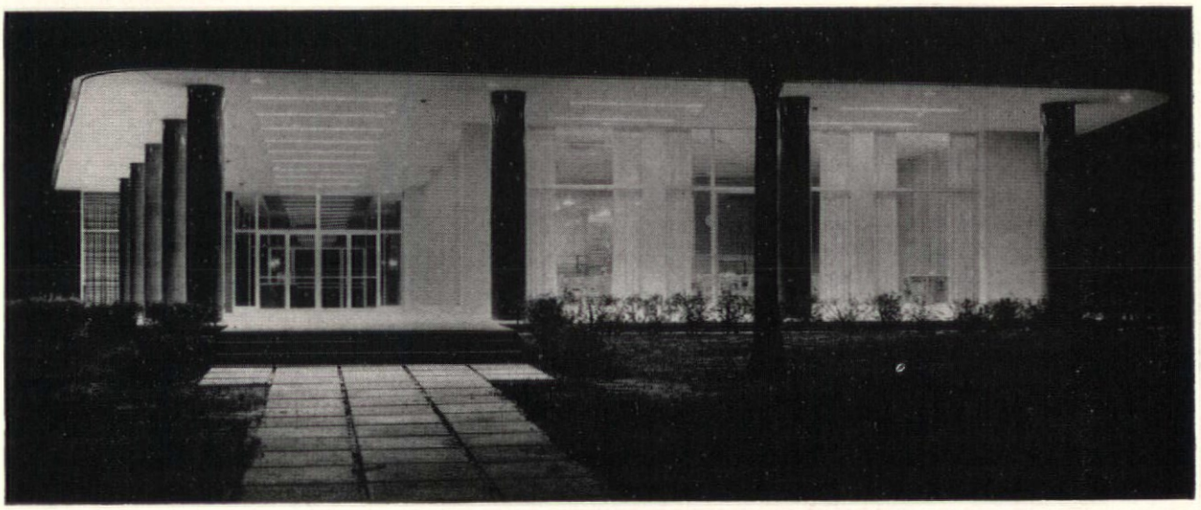
Peninsular Life Insurance Company's in Jacksonville, Florida,

Design it better with **Pittsburgh**

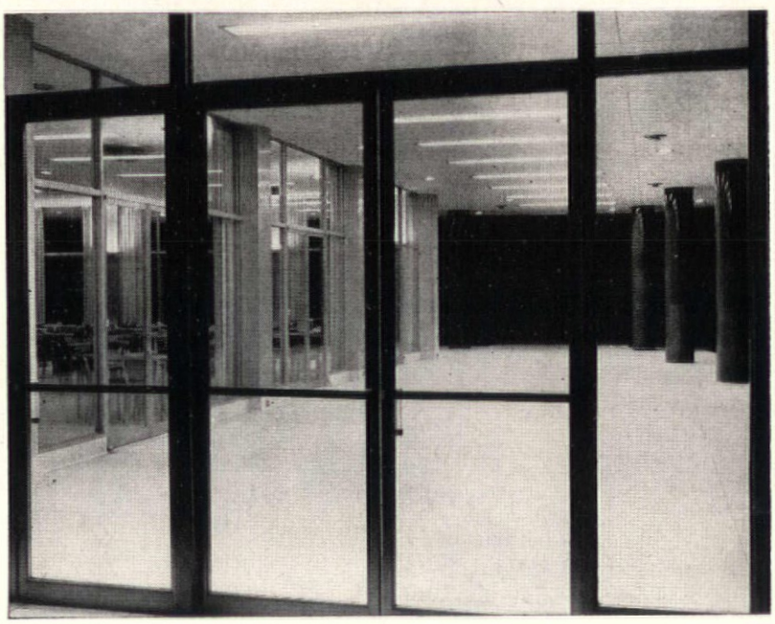
Home Office Building, features Pittsburgh Glass



LARGE EXPANSES of Pittsburgh Plate Glass complement the granite and limestone façade of this imposing six-story building in Jacksonville, Florida. The many picture windows are glazed with Solex® Heat-Absorbing Plate Glass. This not only admits ample daylight to the offices, but also assures cooler interiors and less eye-fatigue among building occupants, since this green-tinted glass substantially reduces solar heat and glare. The east and west walls of the building's auditorium are glazed with PC Glass Blocks, while Pittco® Metal and Copper-Back Mirrors are also effectively used in this distinctively-designed building. Kemp, Bunch & Jackson—Architects, Jacksonville, Florida.



AT NIGHT, the illumination pouring through the large glass areas creates a brilliant spectacle, making the Peninsular Life Insurance Company's Home Office building an impressive point of interest.



THE EASTERN entrance to the building is equipped with double sets of Tubelite® Doors. Their clean, simple lines make these doors adaptable to any style of architecture. Sidelights of Plate Glass flank the doors. This entrance overlooks the covered terrace, river, and glass-enclosed cafeteria seen at left.

Your Sweet's Architectural File contains detailed information on all Pittsburgh Plate Glass Company products . . . Sections 6a, 15d, 20, 12e, 15a.

Glass

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

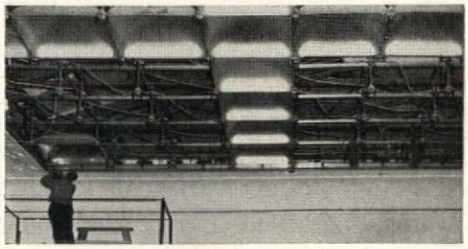
IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

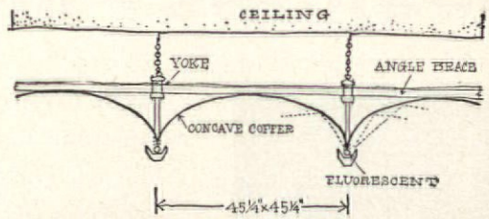
PRODUCTS

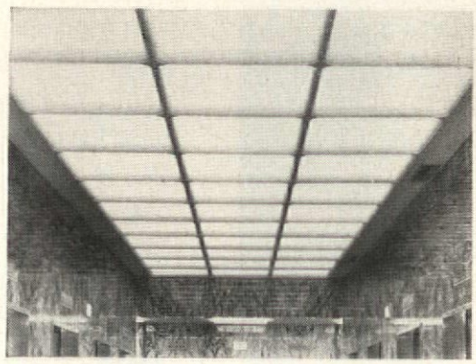
Continued from p. 206

ELEGANT LIGHT CEILING is engineered for art galleries, lobbies, auditoriums

A packaged version of the superluminous ceiling developed for Manhattan's Metropolitan Museum (AF, March '54) is now being mass-fabricated by Laubert Lighting. Planned by the Met's Lighting Engineer Laurence Harrison for use in high ceilings (12′ minimum from floor to mullion grid), the dramatic concave coffers achieve the pleasing reflection qualities of small cloudless skies (45″ across) hung in multiple.







Catalogued as *Laubert Skylight (artificial)*, the suspended ceiling is actually opaque. Its matte-white polyester domes bounce light from fluorescent tubes concealed in the cupped aluminum mullions. (In early installations, shells of light-gauge aluminum often dented in handling; the plastic is proving easier to fabricate, ship and install.) The Laubert clustered domes not only work efficiently as diffusers with low surface brightness, but the ancient architectural pattern of the vault gives a classic air to the contemporaneous luminous ceiling.

Standard suspension calls for a 38″ cavity which allows for duct and pipe runs above alternate coffer rows, so that any dome in an unobstructed row can be lifted out to get to ballasts. Where the initial ceiling layout is designed to include the *Laubert* system, suspension height can be reduced to 21″. Almost fully salvageable, assembled coffer units can be taken down and reinstalled in other locations, like regular luminaires.

Laubert units are made for use with 42″ de luxe cool-white T6 slim lines or cold cathode fluorescents. Performance of the ceiling with slimlines (room or maintenance factors not considered) measured after 1,000 hours of operation at ten hours and one turn-on a day:

Lamp current in milliamperes	Average lumens per coffer	Average brightness in footlamperts
120	1,220	74
200	1,750	106
300	2,100	127

Laubert ceilings can be ordered with sprinkler heads and/or swivel socket fittings and wiring for occasional attachment of spotlights at sash mullion intersections. Current costs run approximately $20 to $25 per sq. ft. completely installed.

Manufacturer: Laubert Lighting Inc., 205 E. 42 St., New York 17, N. Y.

continued on p. 216

Perfect for that new hospital...

Amtico America's most beautiful rubber flooring!

AMERICAN BILTRITE RUBBER COMPANY TRENTON 2, NEW JERSEY

Amtico RUBBER FLOORING

In Canada—American Biltrite Rubber Co. (Canada) Ltd., Sherbrooke, Quebec

- Lifetime Economy
- Easy Maintenance
- Sound-Deadening
- Luxurious Beauty
- Cushioned Resilience
- Fire-Resistant

26 COLOR SAMPLE KIT... YOURS ON REQUEST

AMTICO, Dept. AF-1, Trenton 2, New Jersey
Gentlemen:
Please send me free box of 4″ x 4″ samples of Amtico Flooring in standard 1/8″ gauge and all 26 stock colors—also illustrated literature.

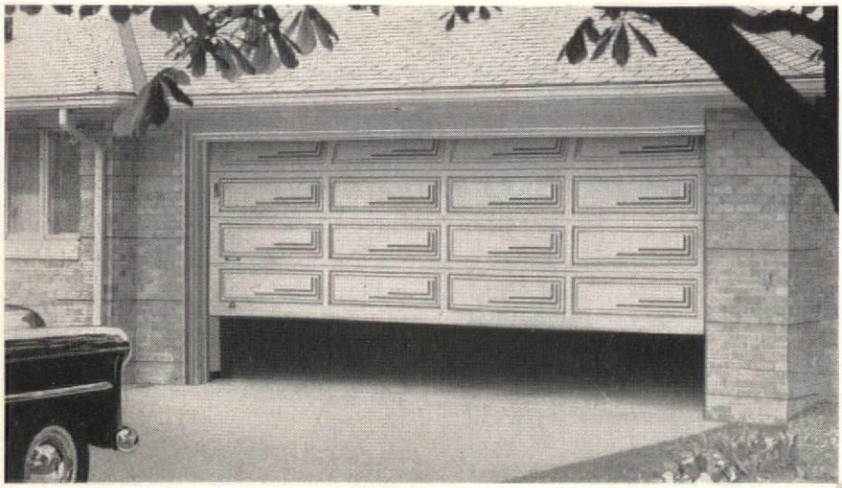
NAME.....
FIRM.....
ADDRESS.....
CITY..... STATE.....
(Please attach coupon to your business card or letterhead)

a Complete Line *of Doors* . . .
a Complete PRICE RANGE!

Visit our Booths...

No. 14, Conrad-Hilton Hotel, NAHB Convention

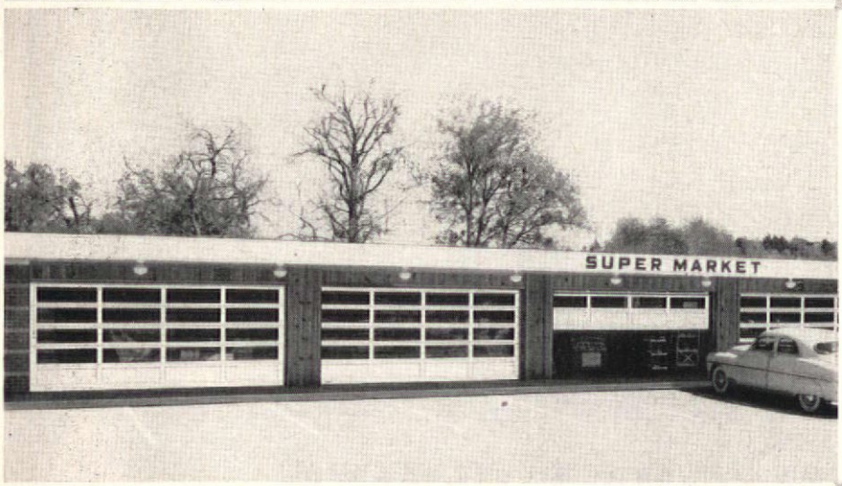
No. 388, International Amphitheater
Plant Maintenance and Engineering Show



THE "OVERHEAD DOOR" TRADE MARK

Residential...

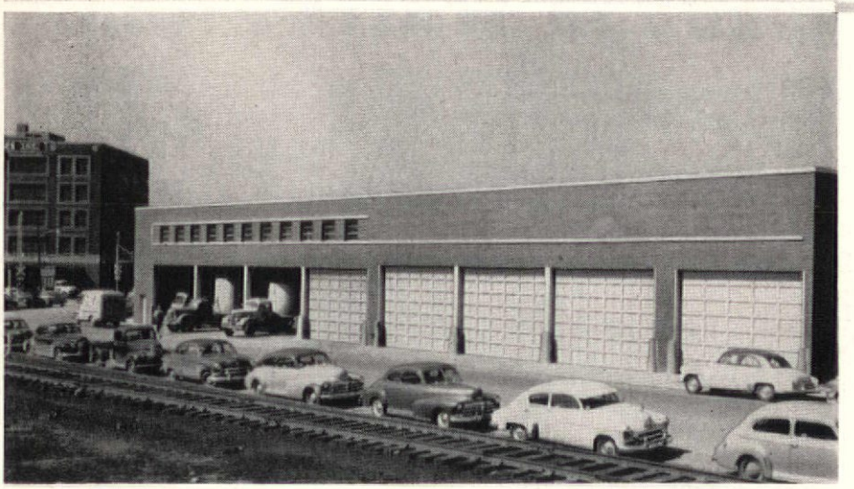
★ **STANDARD DESIGNS** in many sizes
★ **SPECIAL TRIMS** for standard doors
★ **SPECIAL DESIGNS,** raised, routed panels



THE "OVERHEAD DOOR" TRADE MARK

Commercial...

★ **Highway Markets and Restaurants** ★ **Schools**
★ **Service Stations** ★ **Fire Stations** ★ **Hospitals**
★ **Institutions** ★ **Municipal Buildings**



THE "OVERHEAD DOOR" TRADE MARK

Industrial...

★ **Factories** ★ **Warehouses**
★ **Loading Platforms** ★ **Terminals**
★ **Government Buildings** ★ **Military Structures**

America's Great Name in QUALITY DOORS...

OVERHEAD DOOR CORPORATION

GENERAL OFFICES AND MAIN FACTORY • HARTFORD CITY, INDIANA

MANUFACTURING DIVISIONS:

HILLSIDE, NEW JERSEY CORTLAND, NEW YORK OKLAHOMA CITY, OKLAHOMA
NASHUA, NEW HAMPSHIRE LEWISTOWN, PENNSYLVANIA DALLAS, TEXAS PORTLAND, OREGON

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NATION-WIDE SALES • INSTALLATION • SERVICE

1907...

a famous date in construction

...the first white portland cement MEDUSA WHITE was used!

On this historic date the first commercial white portland cement was given to the building field. After years of intensive research Dr. S. B. Newberry had accomplished his life-long quest for a portland cement that was white, and far more beautiful than any other cementitious material. And equally important, his method of making Medusa White cement was so inexpensive that architects and contractors were able to adapt it to a multitude of uses. Within a short time Medusa White became the accepted way for making finer stucco, cast stone, mortar and white concrete. Within a few years it was standard practice for better sculpture, cast slabs and terrazzo.

The pure "diamond blue" whiteness of Dr. Newberry's cement is something that just couldn't be improved. No other cement in the half century since its perfection has ever equaled the white color of Medusa White. It's no wonder that only recently it was selected carefully from all other cements for such outstanding construction as the United Nations Permanent Headquarters and the restoration of Independence Hall.

If you are planning construction of a better type, specify famed "non-staining" Medusa White, the original white portland cement for stucco, pre-cast slabs and terrazzo.

MEDUSA Portland Cement Company

1000 Midland Building • Cleveland 15, Ohio

SALES OFFICES
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Chicago, Illinois — Toledo, Ohio
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Milwaukee, Wisc. — York, Pennsylvania

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WATERPROOFED GRAY • AIR ENTRAINING • STONESET
HIGH EARLY STRENGTH • BRIKSET
WHITE TILE GROUT CEMENT

MAKERS OF AMERICA'S FINEST PORTLAND CEMENTS FOR OVER SIXTY YEARS

White Cross Hospital reports multiple savings after modernizing with

BAYLEY WINDOWS

Read these briefs from the official report:

By replacing swinging type solarium windows at end of corridors with Bayley Aluminum Projected Windows:

1. Daily coal consumption was reduced from 15 ton to 9 ton—a daily savings of $40 to $45.
2. Hallway radiators were eliminated—and still warmer than before.
3. Housekeeping was simplified by less dirt seepage.
4. Maintenance was reduced because of fewer moving window parts.
5. Hazard of patient escape through the windows was reduced.
6. Cost of periodic painting of windows was eliminated.
7. Interior and exterior appearance of building was enhanced.

Meet modern hospital demands for ***better light, air and vision***

Just as others have proved! White Cross Hospital of Columbus, Ohio has found that modernizing by replacement of old style windows with modern Bayley Aluminum Projected Windows results in substantial economies. This is not to speak of improved building appearance, window operating convenience and other advantages from such features as:

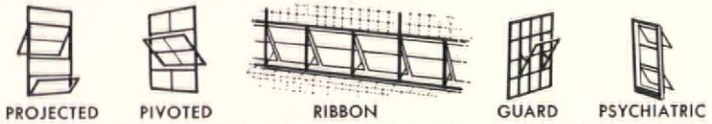
Modern appearance • Economy—painting unnecessary • permanence—long care-free life • Simplicity—no complicated mechanism • Adaptable to all types of construction • Glazing outside—flat surface inside • Easily washed from inside • Prepared for screens • Permits use of accessories, such as draperies, shades, curtains, venetian blinds or awnings.

Combining all these merits with no-draft ventilation, awning-type weather protection, maximum light and vision area, it is easy to realize why there is such a growing preference for Bayley Aluminum Projected windows.

Call Bayley at the start of any plan to modernize. We'll gladly work with you—and through our years of specialized window experience we can very likely render extra consul in both the window selection and building alterations. No obligation.

QUALITY APPROVED P-42

75 *Years of* **RELIABILITY**

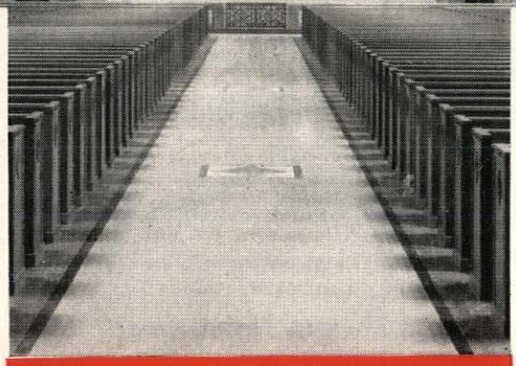


THE WILLIAM BAYLEY COMPANY

Springfield, Ohio

District Sales Offices: Springfield Chicago New York Washington

Airview of SACRED HEART CATHEDRAL showing cruciform design.



SACRED HEART CATHEDRAL

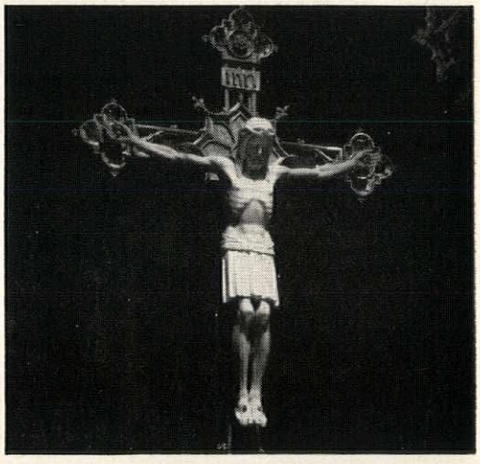
NEWARK, N. J.

Formal Opening October 1954

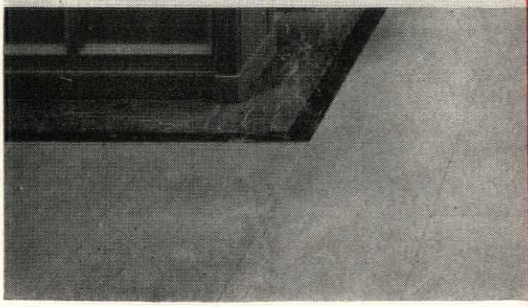
Architect:
PAUL C. REILLY, New York City

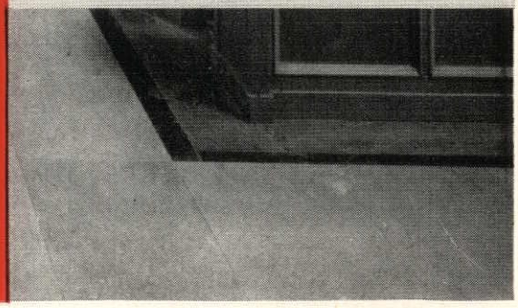
Mechanical Engineers:
SEARS and KOPF
ABRAHAM WALTON, New York

Mechanical Contractor:
FRANK A. McBRIDE CO.,
Patterson, New Jersey



Altar crucifix is life size carved from flesh colored onyx.





Traditional and modern religious buildings both require the greater comfort, fuel economy and dependable performance of

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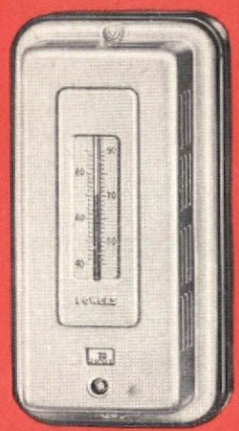
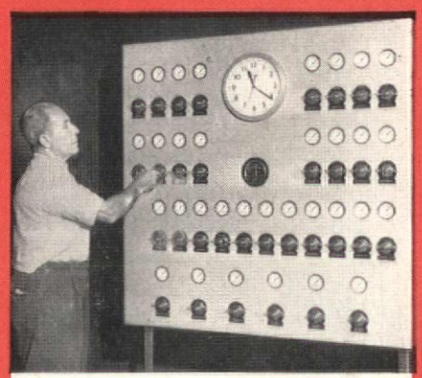
AUTOMATIC SYSTEMS OF
Temperature Control



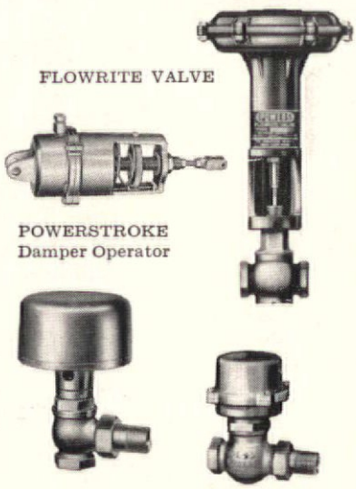
SACRED HEART CATHEDRAL in Newark, New Jersey — a masterpiece of French-Gothic architecture — is one of many distinguished churches and synagogues controlled by Powers.

Here thermal comfort and fuel economy will be assured by the traditional dependability of Powers automatic control regulating the heating and ventilating system throughout the church and rectory. Panel heating system for snow melting installed in the paved plaza leading to the main entrance of the church also is Powers controlled.

Experience gained by Powers, in this and other monumental buildings in the past 60 years, should be helpful to you in selecting the most efficient control for your building . . . regardless of type or size. For further information contact our nearest office or write us direct.



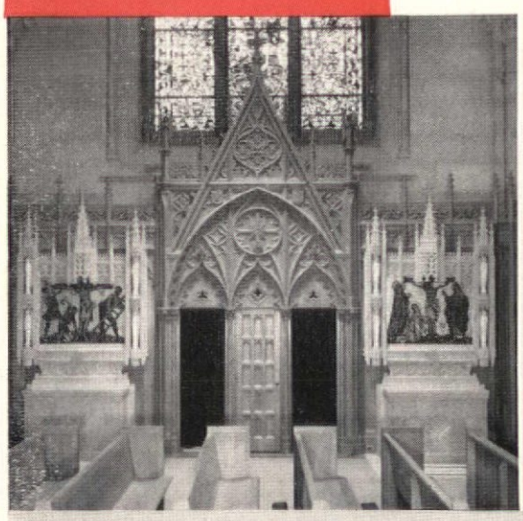
POWERS CONTROL PANEL



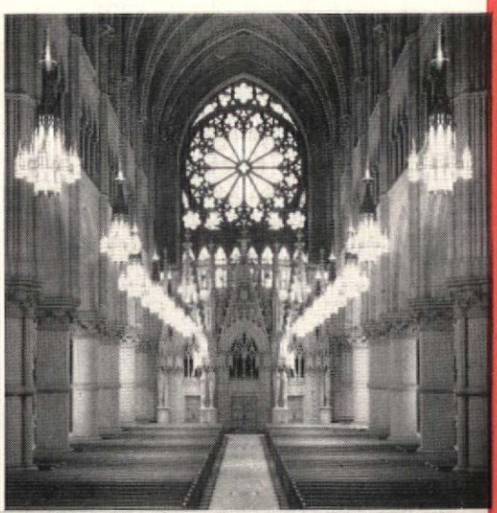
FLOWRITE VALVE

POWERSTROKE
Damper Operator

Powers PACKLESS Control Valves — one of the many superior features of a Powers control system. They eliminate packing maintenance and leakage of water or steam and give smooth accurate control.



Confessionals of hand carved white oak flanked by mosaic stations of the cross.



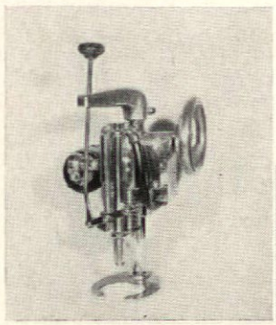
View from altar looking toward rose window over main entrance.

THE POWERS REGULATOR COMPANY

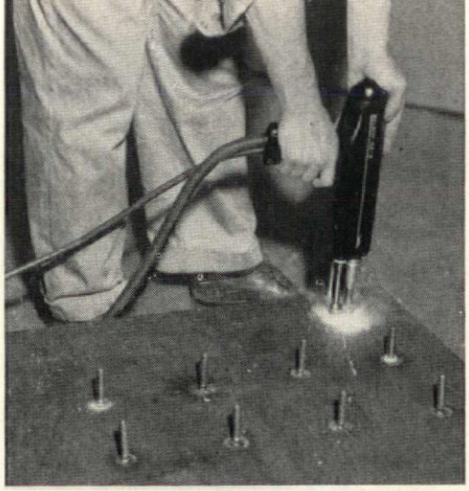
SKOKIE, ILLINOIS | *Offices in chief cities in U.S.A., Canada and Mexico*

Established in 1891 • Over 60 years of Automatic Temperature and Humidity Control

(b97)



Evolution of a stud welder. First Nelson welder had machinery-is-beautiful consciousness of thirties. Model used since 1943 was war weapon with gangster gat hangover. New Ns-9 style (right) is worthy of TV space patrolman.



PRODUCTS

Continued from p. 210

SLEEK STUD WELDER is designed for easy handling, accurate sighting

Nelson's latest revamp of its gun for end-welding of studs makes the tool easy to handle. Eliminating the awkward side cable loop of earlier models, the NS-9 brings cables in through a swept-back handle, running them through a steel barrel in the rugged plastic casing. The smooth molded barrel not only makes precise sighting of studs easier but also gives the tool better balance. Electric connection, cut from three to one, needs little upkeep. Arc lengh can be regulated without disassembling. Adaptable to countless building applications, *Nelweld* guns recently were used to speed erection of the curtain walls on Denver's Mile High Center (AF, Oct. '54). The new models will be made with cable and controls in two sizes: one for studs up to ½" in diameter ($550 F.O.B.) and the other for 10 ga. up to 1" ($650). (The larger will take studs up to 1½" when such control equipment is made available.)

Manufacturer: Nelson Stud Welding, Div. of Gregory Industries, Lorain, Ohio.

Cheerful, Comfortable INTERIORS
Beautiful, Modern EXTERIORS !

GIVE YOUR CLIENTS BOTH WITH .....

Peterson
HORIZONTAL SLIDING
Aluminum Windows

Check These Outstanding Features

ROLLS OPEN
Easy horizontal operation, precision bearing rollers.

SAVES MAINTENANCE
Requires no paint. Won't rust, swell, warp, stick or rot.

WEATHERPROOF
Hi-pile, water and wear resistant weatherstripping cuts heating costs.

SMART STYLING
Enhances all motifs.

EASILY CLEANED
Sliding sash removes into room for easy washing.

SAFE
Positive locking in closed, one, two and three inch open positions.

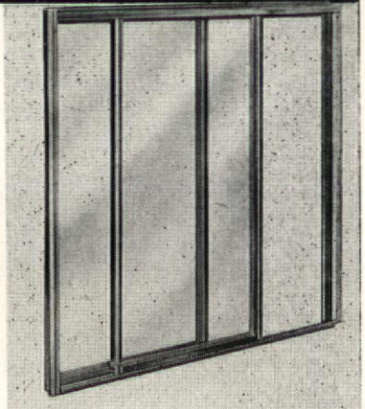
ADVANCED DESIGN
Eliminates putty, sash balances, cranks, hinges.

FURNISHED COMPLETE
Built-in storms and screens, if desired.

50 STANDARD SIZES

All designs and sizes popularly specified for residential, commercial and monumental buildings supplied promptly. Standard windows up to 6′ in height and 10′ in width are available. Special sizes can be obtained at slightly higher cost.

Constructed of sturdy aluminum extrusions—63S-T5 Alloy, minimum thickness .062"—engineered for maximum strength.

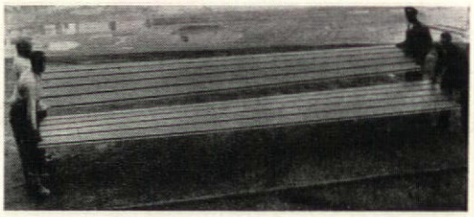


WRITE FOR LITERATURE AND NAME OF NEAREST DEALER

PETERSON

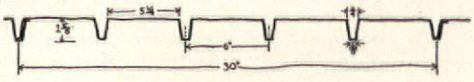
Peterson Window Corp.
1399 E. EIGHT MILE ROAD
FERNDALE 20, MICHIGAN

INQUIRIES FROM INTERESTED DEALERS ARE INVITED



BIG DECK: two pieces cover square of roof

In minutes two men can lay 100 sq. ft. of *Airtherm* steel decking. Reported as the longest 30"-wide panel on the market, the 20′ unit takes few welds and so speeds roof construction. Lengthwise joints are embossed for precise panel alignment. The deck's 1⅝" ribs are 6" o.c. with a ⅝" bearing web and 1"-wide top openings so that all welds can be made topside. Furnished galvan-



ized or with a gray baked enamel coat, the sheet is practical not only as roof deck and subbase for concrete or aggregate floor, but its moderate cost, neatly grooved appearance, and easy application suit it for side wall, marquee and billboard use. It is produced in 18-, 20- and 22-ga. steel and costs $23 to $35 per square, depending on quantity, thickness and finish. Clips are available for fastening insulation board directly to the deck.

Manufacturer: Airtherm Manufacturing Co., 700 S. Spring Ave., St. Louis 10, Mo.

continued on p. 222

We like the door's "electronic politeness"

THE PRUDENTIAL BUILDING
South-Central Home Office
Jacksonville, Florida

The beautiful new 22-story PRUDENTIAL INSURANCE COMPANY BUILDING—tallest office structure in Florida—will have 9 Otis AUTOTRONIC operatorless elevators. It will be the center of Prudential's vast South-Central Home Office operations, and its 8 upper floors will be available to other tenants. This is one of more than 175 new and modernized office buildings, hotels, hospitals, banks, and department stores that have given AUTOTRONIC elevatoring an overwhelming vote of confidence—by buying it!

Architects: Kemp, Bunch & Jackson

Passengers quickly discover why they like the Otis Electronic Elevator Door. It's the invisible *electronic zone of detection* that extends in front of the leading edges of both car and hoistway doors up to shoulder height—*as shown in phantom above*. It inspires passenger confidence.

Whenever this *electronic zone* detects a person's presence in the doorway, the doors politely reverse before they can touch the passenger. But if there is no chance of passenger interference, the doors close promptly after each stop.

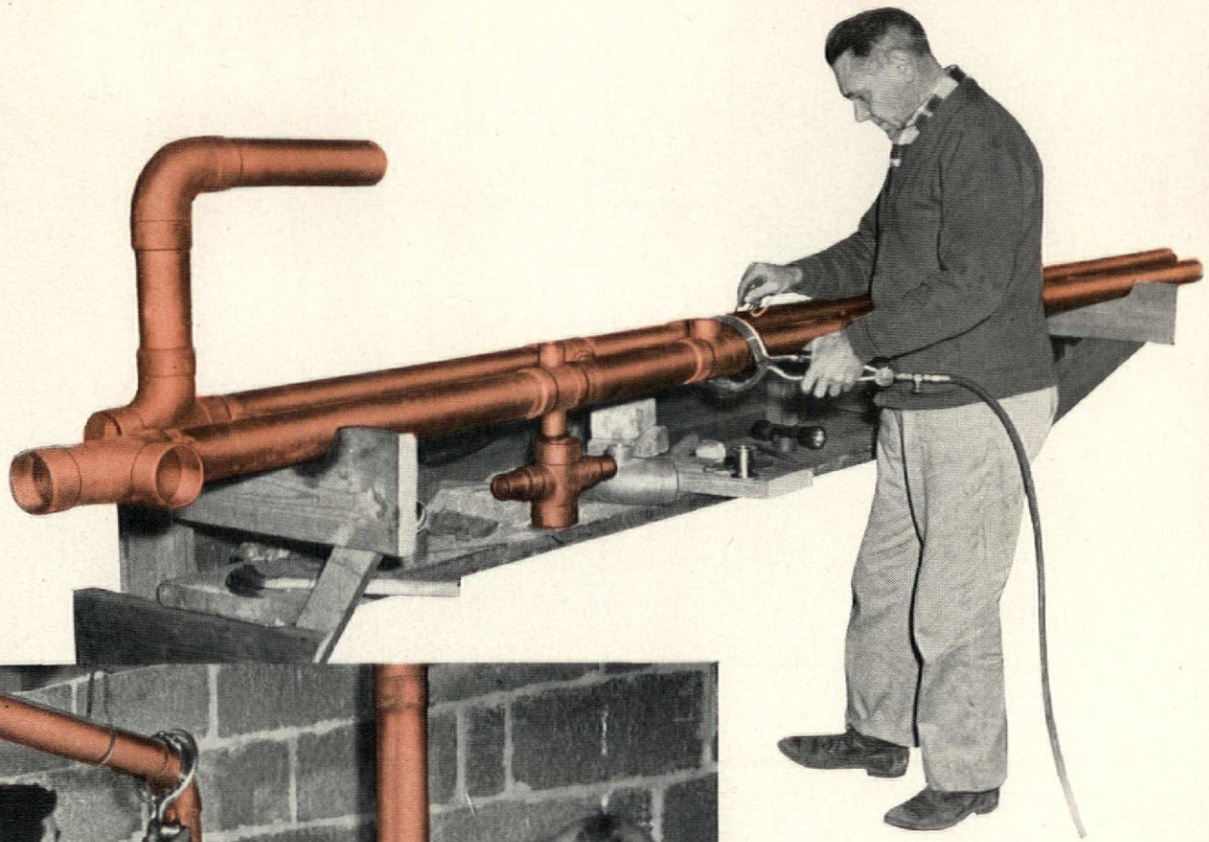
This *zone of detection* prevents unnecessary delays. If a talkative passenger lingers overlong in the doorway, a buzzer sounds and the doors slowly, firmly—but politely nudge the passenger out of the doorway so that the car can proceed on its way.

The Otis Electronic Elevator Door is the crowning achievement in the field of the operatorless elevator. Its successful development insured the ability of operatorless elevators to move great masses of people in busy buildings with the greatest degree of safety. Ask any of our 268 offices for details.

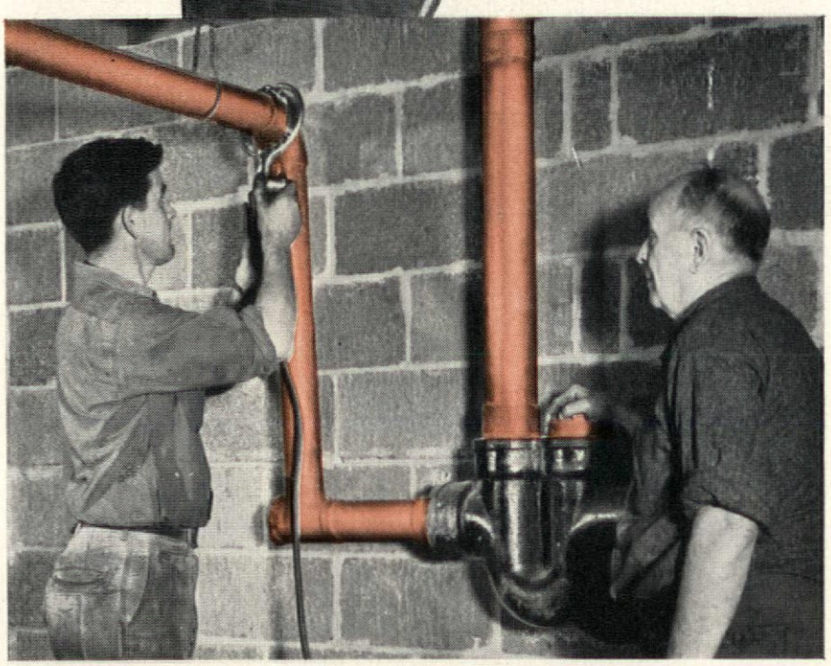
Otis Elevator Company, 260 11th Ave., New York 1, N. Y.

COMPLETELY AUTOMATIC
AUTOTRONIC®
ELEVATORING

Do you realize the savings copper drainage



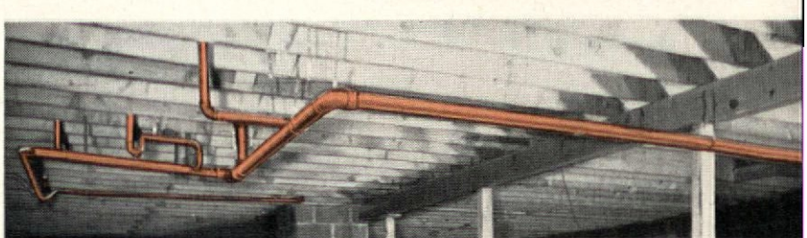
LIGHTWEIGHT PERMITS PRE-ASSEMBLY. ANACONDA Type M Copper Tubes permit more pre-assembly work at the shop. Even large units can be handled easily. A copper tube and fittings installation weighs about ¼ as much as ferrous materials.



FAST, EASY-TO-MAKE JOINTS. Solder-type fittings save hours. No threading, no pouring and caulking.

EASY TO HANDLE. In 3″ diameter, a 20′ length of ANACONDA Type M Copper Tube weighs only 54 lb. Lightweight makes them easy to handle, assemble and hang. Contractors can rough in faster with copper tube and soldered fittings than with heavy pipe and threaded or caulked connections.

LONG LENGTHS ELIMINATE MANY JOINTS. ANACONDA Type M Copper Tubes come in standard 20′ lengths. This saves contractors' time and fittings when long runs are required.



systems can provide?

If you have never specified a drainage system in copper, we suggest you try it soon, if code permits. Then ask the contractor to compare time and costs.

Shop fabrication of stack, waste and vent sections . . . ease of making solder connections . . . use of standard 20'-lengths for long runs . . . elimination of wide plumbing walls or "build-outs"—all add up to savings.

Many builders know what many plumbing contractors have proved: that soil, waste and vent lines of ANACONDA Copper Tubes and Fittings can cost *less*. Here are just 3 examples. (Names and addresses furnished on request.)

- **CASE A.** Plumbing Contractor "A" bid an "all-copper" job for a housing development—water and drainage lines. His bid was 10% lower than other bids based on copper for water pipe only.

- **CASE B.** Contractor "B" was awarded a job on a small-size house. Before he started, the owner changed the specification to copper. When the job was completed, he figured he had saved $19.01 over a comparable installation of ferrous pipe.

- **CASE C.** Contractor "C's" figures show that on his first copper drainage system he cut installation time ⅓, compared with similar size jobs using heavy wrought or cast piping.

In addition to installation savings, the use of nationally known ANACONDA Copper Tubes and Fittings adds to the salability of new homes. Home buyers know and respect copper's quality and freedom from maintenance.

Send for your free copy of "Copper Tube Drainage Systems." This booklet gives all the information you need on tubes, fittings and their installation. Fill in and mail coupon below. 5412A

Advantages of copper tubes and cast bronze solder type drainage fittings for soil, waste and vent lines

- **big savings in installation time and costs**
- **economies effected by pre-assembly work done in the shop or on the jobsite**
- **carpentry savings**
- **mark of quality construction**

ANACONDA®
COPPER TUBES
Available through plumbing wholesalers

SAVES CARPENTRY AND SPACE. A 3″ copper tube stack with fittings fits inside a 4″ partition. Trim copper tube and compact fittings give greater freedom of placement . . . reduce cutting of studs and joists. No need to plan for wide plumbing walls or build-outs.

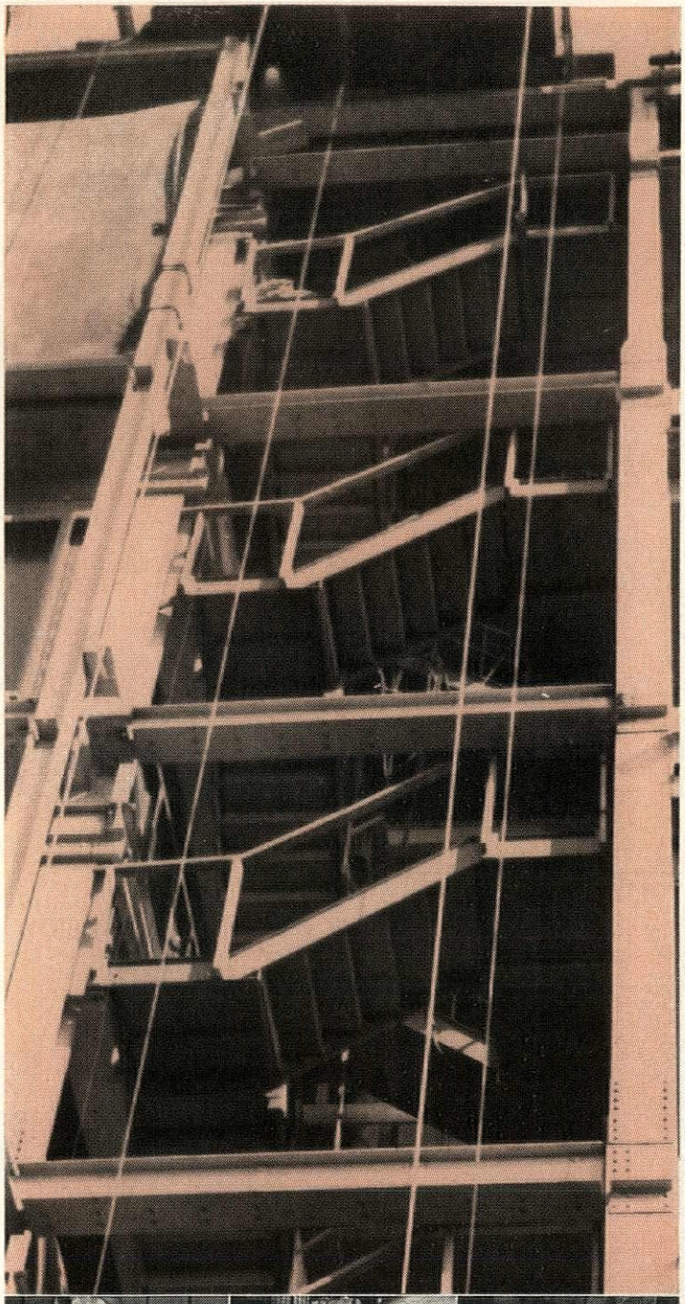
FREE BOOKLET!

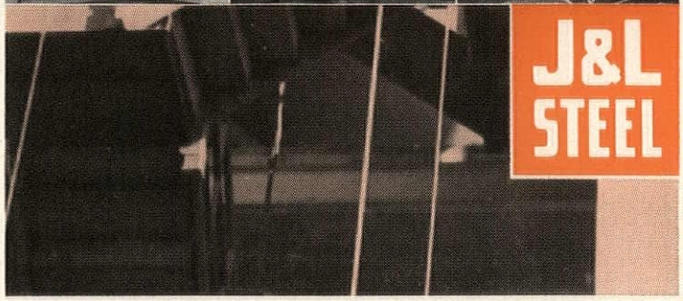
The American Brass Company,
Waterbury 20, Conn.

(In Canada: Anaconda American Brass Ltd., New Toronto, Ont.)

Please send me free booklet, "Copper Tube Drainage Systems," which shows how to cut costs with copper.

NAME _____
(PLEASE PRINT)
COMPANY _____
STREET _____
CITY _____ ZONE _____ STATE _____





Stair Specialists

cut costs with

J & L Junior Channels

Michael Pfaff and his sons Bill and Dick are experts on how to get up in the world economically. They build steel stairs with J&L Junior Channels. In fact during 1953 alone, their company, Standard Metal Products, built 456 floors of stairs—five times the height of the Empire State Building.

One of the big reasons for Standard's success is the way Junior Channels help out in production and shipping costs. Mr. Pfaff reports the company saves about 20 percent in shipping weight on the stairs fabricated with lightweight Junior Channels over an equivalent stair built of ordinary channels. In other words, for each ten floors of stairs two floors are shipped free.

Another advantage pointed out by Mr. Pfaff is that the lightweight J&L Channels can be handled faster and easier during fabrication and finishing. J&L Junior Channel stair stringers are strong, lightweight members. 12 inch sections weigh only 10.6 pounds per lineal foot . . . 10 inch sections 6.5 or 8.4 pounds depending on the web thickness required. A standard structural channel of the same height would weigh almost twice as much. Standard Metal Products Company translates this weight-saving feature into a dollar savings because less weight means less fabricating, erecting and material cost.

Finally, J&L Junior Channel stair stringers provide clean, straight lines that give excellent appearance without further finishing and take ornamental trim readily.

Check the many outstanding features of J&L Junior Channels for yourself. Write today for our booklet, "J&L Junior Channels."

Junior Channels Are Readily Available for Prompt Delivery

Jones & Laughlin

STEEL CORPORATION — *Pittsburgh*

Jones & Laughlin Steel Corporation
491 Gateway Center, Pittsburgh, Pa.

Please send me a free copy of your J&L Junior Channel Booklet.

Name_____

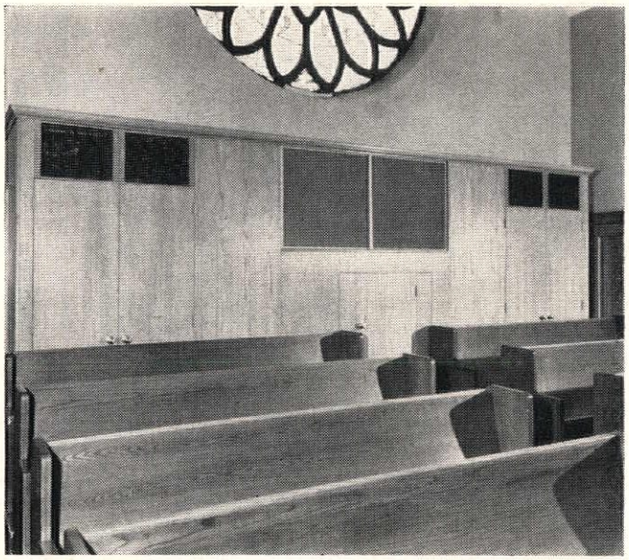
Company_____

Address_____

Which is
the best way
to air condition
a CHURCH?

Carrier Duct System in First Baptist Church, Charlotte, N. C., has balcony-suspended outlets which spread a low blanket of conditioned air over congregation. Undisturbed upper air in dome acts as insulation, permitted use of smaller equipment.

Carrier Fan-coil Units are located around perimeter walls and at pew ends along center aisles in The Cathedral of the Sacred Heart, Dallas. This unique air distribution method made it possible to cut size of the air conditioning system from 125 to 83 tons.



Carrier Self-contained Units air condition beautiful old St. Paul's at Grosse Pointe Farms, Mich. Two 7½-ton Weathermakers are located in the choir loft, two are built into confessional booth cabinetwork. Church estimates $15,000 saving.

Carrier is the quickest way to the right answer

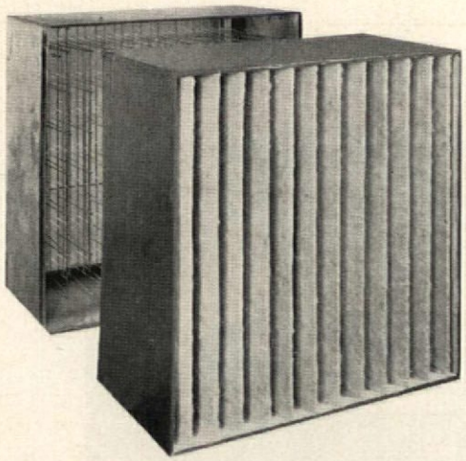
JUST 1–2 AND THE JOB IS THROUGH!

Carrier has *all* the ways to air condition *any* job—and all Carrier equipment is engineered to the same uniform standard. So short-cut hours of selection by (1) using the Carrier line as your shopping guide and then (2) comparing values. Get in touch with your Carrier dealer or distributor. He's listed in the Classified Telephone Directory. Or write to us directly. Carrier Corporation, Syracuse, New York.

Carrier air conditioning · refrigeration · industrial heating

PRODUCTS

Continued from p. 216

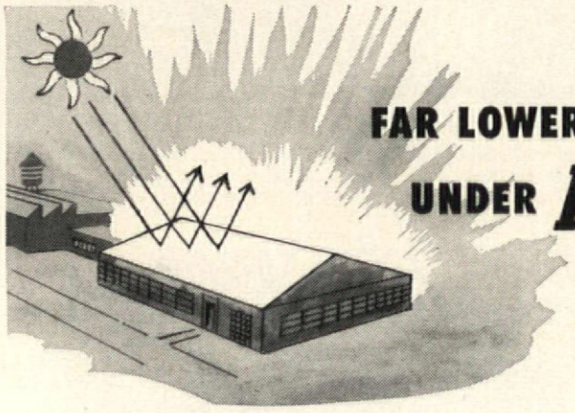


STACKED-DECK FILTER matches efficiency of electrostatic precipitator

Putting its *Aerosolve* filter to the National Bureau of Standards' Discoloration Test for precipitators, Cambridge has proved that its meticulously engineered bank of glass-fiber mats equal the 85 to 90% effectiveness of electrostatic units, and if need be better that performance by 5%. (According to Cambridge most other air filters rate less than 25% efficiency on this test.) Filter cartridges for the 2′ square, 1′ deep, cadmium-plated steel frame are available in 35, 85 and 95 efficiency ratings and are easily interchangeable. The unit's excellence in accumulating dirt causes little drop in air pressure; the unique mats which trap dust and fumes in their deeply pleated fibrous pile are stacked to offer little resistance to the air flow. The permanent frame costs $45 and the three types of cartridges range from $12 to $16. Complete costs, installed and including ductwork, run about $75 to $80 for each of these 1,000 cfm units. Yearly owning and operating costs average under $40.

For air-conditioning applications requiring the ultimate in air purity, Cambridge produces a filter called the *Absolute*. This minutely pleated unit, developed for the AEC to remove radioactive particles, can get a grip on bacteria and mold spores, making air sterile for touchy labs and production lines.

Manufacturer: Cambridge Filter Corp., 738 Erie Blvd. East, Syracuse 3, N.Y.



FAR LOWER TEMPERATURE UNDER Karnak® ALUMINUM COATING

An exclusive combination of flat aluminum flakes and specially prepared asphalt provides unique cooling and protective qualities. The asphalt penetrates, grips and weatherproofs. *The aluminum flakes flow to the surface and flatten into an opaque, metallic shield that reflects heat, ultra-violet, even infra-red rays thus preserving the underlayers of roofing.*

A heat lamp applied equally to an asphalt shingle or composition roofing, one half of which is coated with Karnak Aluminum-Asphalt Coating, *shows a temperature under the coated side 50° lower than under the uncoated side.* This lower temperature not only assures a cooler area under this surface but also protects the roofing. The test shows that high heat breaks down the roofing structure on the uncoated half thus shortening its life.

The liquid applies easily, as supplied in the container, by spray or brush. ***Manufactured by Lewis Asphalt Engineering Corp., 30 Church St., New York 7, N. Y.***

Look for the Warranty Seal

It guarantees 2 lbs. of aluminum pigment per gallon, assuring adequate aluminum to provide a good shield and hold it. Inferior coatings do not have this warranty.

50° LOWER BY TEST

Heat lamp application dramatically shows 50° lower temperature under the half of the shingle coated with Karnak Aluminum-Asphalt Coating.

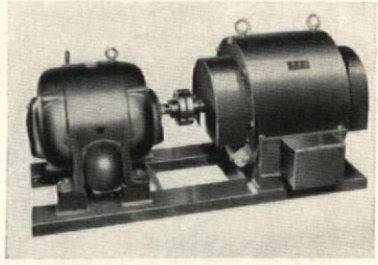
© L A E Corp.

see our catalog in S or write for copy

USE OTHER KARNAK PRODUCTS, TOO

Membrane Waterproofing Fabric • Asphalt Roof Coatings and Cements
Calking Compounds Asphalt Emulsions Tile Cement
Asphalt Paint Wood Block Mastic Joint Filler

KARNAK asphalt products



HIGH FREQUENCY POWER cures fluorescents of flicker, does away with costly ballasts

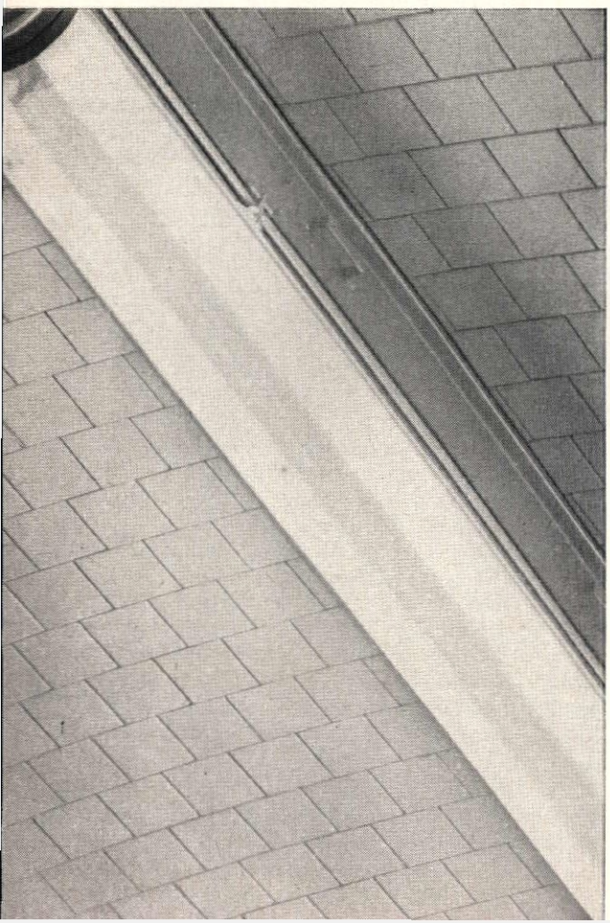
Regular fluorescent lamps give better and brighter light when run on 400-cycle power. In experiments with rotary convertors, General Electric showed the lamps could provide 22% more illumination (AF, April '53), and with complete absence of stroboscopic effects. Now Bogue Electric's development of a compact frequency changer brings the conversion of 60 cycle AC utility current to high frequency DC within a reasonable price range for laboratories, production lines, and offices where lighting quality is critically important.

The Bogue machine that portends the end of fluorescent flicker—and accompanying eye discomfort—consists of an induction motor hooked up to a 400-cycle generator that puts out the right shape wave length to do the job. (A similar unit currently is being used to operate ship radio gear.) Available in ratings up to 50 kw, the generators make up for part of their cost (about $375 per ½ kw—enough power for lamps totaling 500 w.) in the lighting system: instead of the $7 to $20 lamp ballasts required on 60-cycle power, 50¢ capacitors are wired to the lamps. And these same devices can be used for dimming by switching smaller ones in series.

Manufacturer: Bogue Electric Mfg. Co., Paterson, N. J.

continued on p. 224

3232 feet of extruded Du Pont "Lucite" acrylic resin is used in the modern Broadway Tunnel that extends under San Francisco's Russian Hill. Below: Close-up of a fixture of "Lucite." This engineering material provides high visibility without glare. Has durability and beauty. (Manufactured by Sunbeam Lighting Company, Los Angeles, California.)



PRIZE-WINNING LIGHTING

These weather-resistant, glare-proof fixtures feature extruded Du Pont LUCITE®

San Francisco's Broadway Tunnel has set a new high standard for *scientific lighting*. It was planned that way. Lighting engineers specified fixtures of Du Pont "Lucite" acrylic resin to achieve maximum visibility without glare . . . safe and gradual changes in light intensity.

These fixtures of extruded "Lucite" are ribbed on the inside to diffuse light. Their smooth, outer surfaces resist weathering and exhaust fumes. They are cleaned easily with a 100 p.s.i. water-detergent spray.

Beautiful "Lucite" is economically fabricated and will conform to any design. It comes in a variety of clear, translucent and opaque colors. Write E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Room 291, Wilmington 98, Delaware, for further information.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

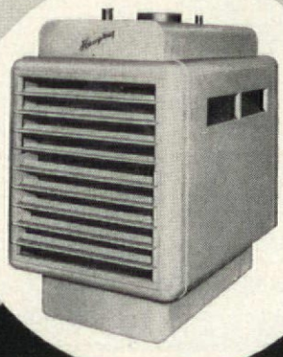
PRODUCTS *continued from p. 222*

CLASSROOM FURNITURE designed by Russel Wright, is lightweight, easily moved

Last month Shwayder Brothers, makers of *Samsonite* luggage and folding chairs, unveiled a Russel Wright–designed line of furniture for contemporary classrooms. This group of sturdily constructed chairs and desks is made of plywood and reinforced plastic with tubular steel frames and legs. Chairs have curled-lip plywood seats with molded plastic contour-fitting backs designed to adjust automatically to shifting students. Desk tops come in three surfaces: plastic laminated plywood, solid maple or birch, and maple plywood. Light in weight, the furniture has ball-and-socket glides for easy maneuverability; the glides are self-adjusting to any floor surface. The line was designed in four colors: turquoise, rust-red, cocoa brown and light gray. Prices will be available when the furniture gets into production sometime this month.

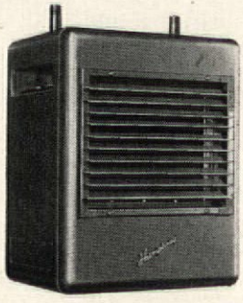
Manufacturer: Schwayder Brothers, Inc., 1050 South Broadway, Denver.

Series A Automatic Gas Unit Heater with numerous superior features such as Free-Flow Heat Exchanger; non-clogging dustproof Pilot; Dual Flame Burner with stainless steel burner tips; Tilting Front, etc. Choice of propellor type fan or blower. Sizes from 65,000 to 200,000 B.T.U. Rich, dust-resisting, Ivory baked enamel finish. Full safety controls.



Greatest Name in GAS UNIT HEATERS

Humphrey



Model 40-G Small size Gas Unit Heater of 40,000 B.T.U. input capacity. Compact cabinet measures only 17" x 22⅜" x 13¼". Approved for 6" clearance at top and sides. Rear vent makes it easy to install close to ceiling. Built throughout to highest Humphrey quality standards. Handsome hammertone baked enamel finish. Propellor type fan. Full safety controls. Priced economically.

HUMPHREY PRODUCTS

GENERAL GAS LIGHT COMPANY • KALAMAZOO, MICH.

Originators of Gas Unit Heaters

PLASTIC DRAWERS are molded in one piece

Bakelite has found not one but two fabricators for an excellent product developed last year: a jointless, warpless, dustless drawer molded of hard phenolic resins in one piece—runner included. Designed for use on the simplest frame, the good-looking lightweight drawers should work well for built-in storage in schoolrooms, small stores, apartments. Pigmented black throughout, the plastic units need no paint or finish. Boonton's drawers, 4¾" high, come in two widths: 16¾" and 17⅛", both priced at $15.80 for sets of four. Richardson's slightly larger drawers of the same pattern measure 18" across, 6" high and cost $5.95 a piece with discounts on large quantities.

Manufacturers: Boonton Molding Co., Boonton 1, N. J., Richardson Co., Melrose Park, Ill.

continued on p. 228

THE TIMELESS BEAUTY OF STONE

Actual size of facing on panel shown.

Marietta

insulated precast concrete wall panels in glowing colors and rich textures...

Marietta Precast Wall Panels, long known for their many valuable time, cost and labor-saving advantages in curtain wall construction, are now available with colorful architecturally-finished stone facings cast integrally with the panel.

Easy to erect, they are practical and thermally-efficient. These Marietta Precast Wall Panels provide the architect and builder a multitude of intriguing design possibilities.

A wide range of attractive colors and textures is offered to meet every requirement of industrial and commercial construction providing striking exteriors with all the beauty of natural stone, yet at extremely moderate cost.

An informative booklet giving all the details about Marietta Wall Panels is yours for the asking. Write today for complete information.

THE Marietta CONCRETE CORPORATION MARIETTA, OHIO

BRANCH OFFICES: 501 Fifth Ave., New York 17, N. Y. • Race Rd. at Pulaski Hwy., Baltimore 21, Md. Box 5192, Charlotte 6, N. C. • 411 Foster St., Nashville, Tenn. • Hollywood, Fla. Box 592, Jamestown, N. Y.

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PRECAST CONCRETE PRODUCTS FOR FARM, HOME AND INDUSTRY

You don't have to shop around... Allegheny Stainless is produced in every form you may need

You ought to have a copy of our PUBLICATION LIST

This 8-page bulletin lists and describes all the current publications on the principal families of A-L Products: stainless and heat-resisting steels, tool and die steels, electrical steels and alloys, permanent magnet materials, and Carmet carbides. There is a handy order form for your convenience in getting the material you need: technical and fabricating data, information on applications and fields of utility, etc. *Write for your copy.*

ADDRESS DEPT. B-61

WHATEVER your stainless steel requirements may be, you can satisfy them with Allegheny Metal.

It's produced in any grade, form or finish you want—from the finest wire to heavy plates, castings and forgings, including sheets, strip, bars, shapes, tubes—*everything!*

That's not only handy, but advantageous: one reliable source, one undivided responsibility, one well-known standard of quality and uniformity.

Complete technical and fabricating data—engineering help, too—are yours for the asking. Just keep it in mind to specify "Allegheny Metal" when you're in the stainless market. And remember, wherever you use it, Allegheny Metal looks better, lasts longer, usually works out to be cheaper in the long run. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.***

You can make it BETTER with

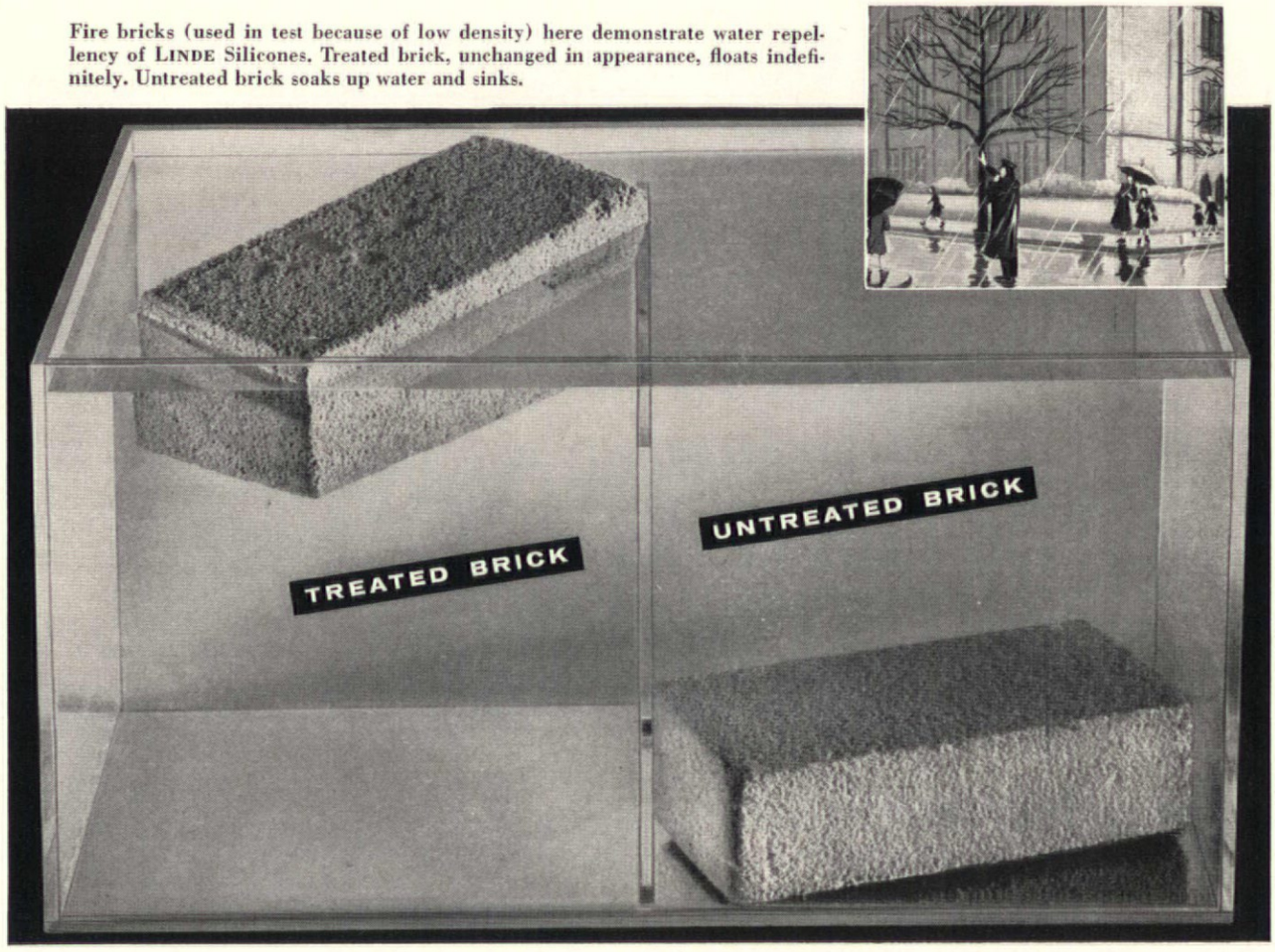
Allegheny Metal

Warehouse stocks carried by all Ryerson plants

AL TIME-TESTED STAINLESS STEEL

W&D 474

Fire bricks (used in test because of low density) here demonstrate water repellency of LINDE Silicones. Treated brick, unchanged in appearance, floats indefinitely. Untreated brick soaks up water and sinks.



How buildings can keep their heads above water

You can keep water out of your above-grade brick and masonry walls just as it's kept out of that floating brick, above.

Above-grade masonry water repellents made with LINDE Silicones do the job. Tests already indicate they last ten years and up.

Damage to interiors from seepage is eliminated. Repair and maintenance costs really drop.

Fully protect new buildings. Fix up old buildings. These silicone-based water repellents prevent even 100-mile-an-hour wind-driven rain from penetrating brick and concrete. They do not change surface appearance. Yet they *do* keep building surfaces clean, since water simply rolls down the sides, carrying dirt with it. Streaking and efflorescence are stopped. They are easily applied by spray or brush.

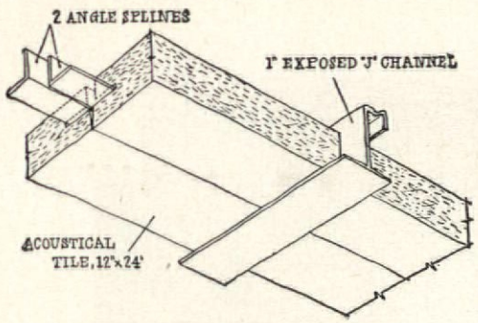
These silicone masonry water repellents end spalling and cracking caused by freezing moisture. They even prevent seepage where exhaust fans reduce indoor air pressure. They let no outdoor water in, yet the pores of the masonry can still "breathe."

For full details on above-grade masonry water repellents made with LINDE Silicones, and a list of representative suppliers, write Dept. **A-1.**

Linde AIR PRODUCTS COMPANY | A DIVISION OF UNION CARBIDE AND CARBON CORPORATION

General Offices: 30 East 42nd Street, New York 17, N. Y.
In Canada: Dominion Oxygen Company, Division of Union Carbide Canada Limited

The term "Linde" is a registered trade-mark of Union Carbide and Carbon Corporation.



PRODUCTS

Continued from p. 224

SUSPENDED CEILING of big tiles offers easy access to utilities overhead

Costing as little as cement-applied acoustic ceilings, Gold Bond *Exposed J* suspension systems make every one of the large 1′ x 2′ tiles resting on its slim flanges a ready access opening to ductwork, wiring and plumbing lines above. Not so completely inobtrusive as the *Concealed J* (in which suspended tiles are gripped through butting kerfs by 8′ splines and show no visible means of support), the *Exposed J*'s are visible as discreet white flat bands running 2′ apart. These pre-enameled bands are actually the flanges of the 1-5/16″-high supporting steel channels. The other basic component in the assembly is a tempered steel wire clip that is inserted inside the channel and snap-locks over the runner. Both "J" systems are designed also to hold gypsum board or sheathing bases so that, besides the directly suspended title, other types of acoustical materials can be applied with cement, screws or spray gun. Installations of *Concealed J* run between 60¢ and 70¢ psf with *Travacoustic* 1′ square tile ⅞″ thick and the *Exposed*, 65¢ to 75¢, using 1′ x 2′ acoustic tile.

Manufacturer: National Gypsum Co., Buffalo 2, N.Y.

Coal heat ...produced with a WILL-BURT STOKER IS LOW COST HEAT

... Heat generated by means that assures a factor of greater safety at all times

Will-Burt Stokers give relief from time-wasting grief at the installation stage and throughout the heating season.

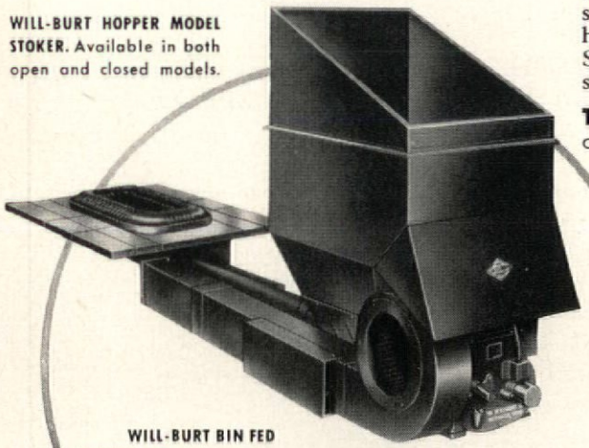
Will-Burt Stokers are used widely with various types of bituminous coal boilers and furnaces for heating schools, hospitals, institutions, greenhouses, country clubs, churches and factories.

Will-Burt exclusive Patented Automatic Air Control assures efficient combustion of bituminous coal during operating and off periods. Air induced by natural draft through the Automatic Air Control when blower is idle is sufficient to prevent a condition of smoke and soot such as is usually prevalent when the fire is starved for air.

Will-Burt Stokers are available in open and closed hopper models and the bin fed type. A factor of greater safety in automatically controlled heating is assured with Will-Burt Stokers because of their unique safety devices and controls.

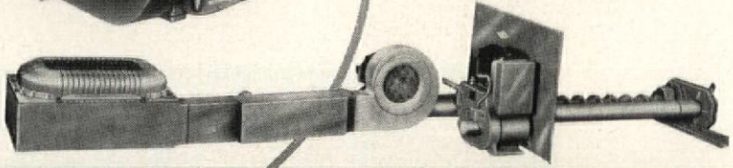
THE WILL-BURT COMPANY
OVER TWENTY-FIVE YEARS IN THE STOKER BUSINESS

WILL-BURT HOPPER MODEL STOKER. Available in both open and closed models.



Write on your letterhead for the Will-Burt Stoker Data Book, complete with engineering information, dimension and installation drawings, suggested specifications, etc. A valuable reference book, especially for architects and engineers.

WILL-BURT BIN FED STOKERS. For bituminous coal burning boilers and furnaces.



The Will-Burt Company
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TECHNICAL PUBLICATIONS

BUILDING PANELS

Daycor — The "Durability Plus" Structural Panels. Strick Plastics Co., Whitaker and Godfrey Aves., Philadelphia 24, Pa. 4 pp. 8½″ x 11″

What to Look For In a Good Translucent Building Panel. Corrulux Div., Libbey-Owens-Ford Glass Co., Dept. 991, P. O. Box 20026, Houston, Tex. 4 pp. 8½″ x 11″

CEILING AND WALL PANELS

Prefabricated-Prefinished Korolock Ceiling and Wall Panels. Marsh Wall Products, Inc., Dover, Ohio. 4 pp. 8½″ x 11″

COMPACTION EQUIPMENT

Compaction Handbook. Gunderson-Taylor Machinery Co., 1201-1237 Shoshone St., Denver 4, Col. 28 pp. 5″ x 7″

CONCRETE MASONRY

Waylite—The Modern Lightweight Masonry Unit for Walls and Floors. Waylite Co., P. O. Box 30, Bethlehem, Pa. 24 pp. 8½″ x 11″

The Besser Era—A Half Century of Concrete

continued on p. 230

"Tippecanoe and DURIRON, too!"

The new
Tippecanoe Laboratories

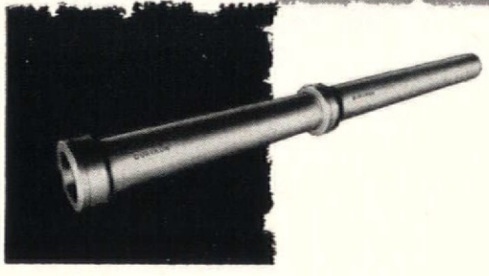
ELI LILLY AND COMPANY
Lafayette, Indiana

with DURIRON Corrosion Resisting Drain Lines

Eli Lilly and Company is one of the country's largest manufacturers of pharmaceuticals and biologicals. At their new Tippecanoe Laboratories, where they are producing chiefly Ilotycin (Erythromycin, Lilly) and other antibiotics, Duriron has been installed for the corrosive waste disposal lines.

Duriron acid-proof drain pipe and fittings are used wherever there is a severe corrosion problem—in laboratories, schools, hospitals, and industrial buildings. Wherever *permanence* is a must, *Duriron* is a must. The first cost is last cost. For the life of the building, insist upon Duriron.

Full details are contained in free catalog PF/4



THE DURIRON COMPANY, Inc.
Dayton, Ohio

DURIRON
LOOK FOR THE NAME ON EVERY PIECE

TECHNICAL PUBLICATIONS

Continued from p. 228

Masonry Progress. Besser Mfg. Co., Alpena, Mich. 48 pp. 8½" x 11"

CONCRETE REINFORCING STEEL

The Fable of the Meticulous Engineer. Concrete Reinforcing Steel Institute, 38 S. Dearborn St., Chicago 3, Ill. 32 pp. 5¾" x 4"

DOORS AND WINDOWS

ACE Durador—the factory door with nine lives. American Hard Rubber Co., 93 Worth St., New York 13, N.Y. 4 pp. 8½" x 11"

Bayley Steel Windows and Doors. The William Bayley Co., Springfield, Ohio. 36 pp. 8½" x 11"

Fenestra Hollow Metal Swing Door Units. Detroit Steel Products Co., 3111 Griffin St., Detroit 11, Mich. 4 pp. 8½" x 11"

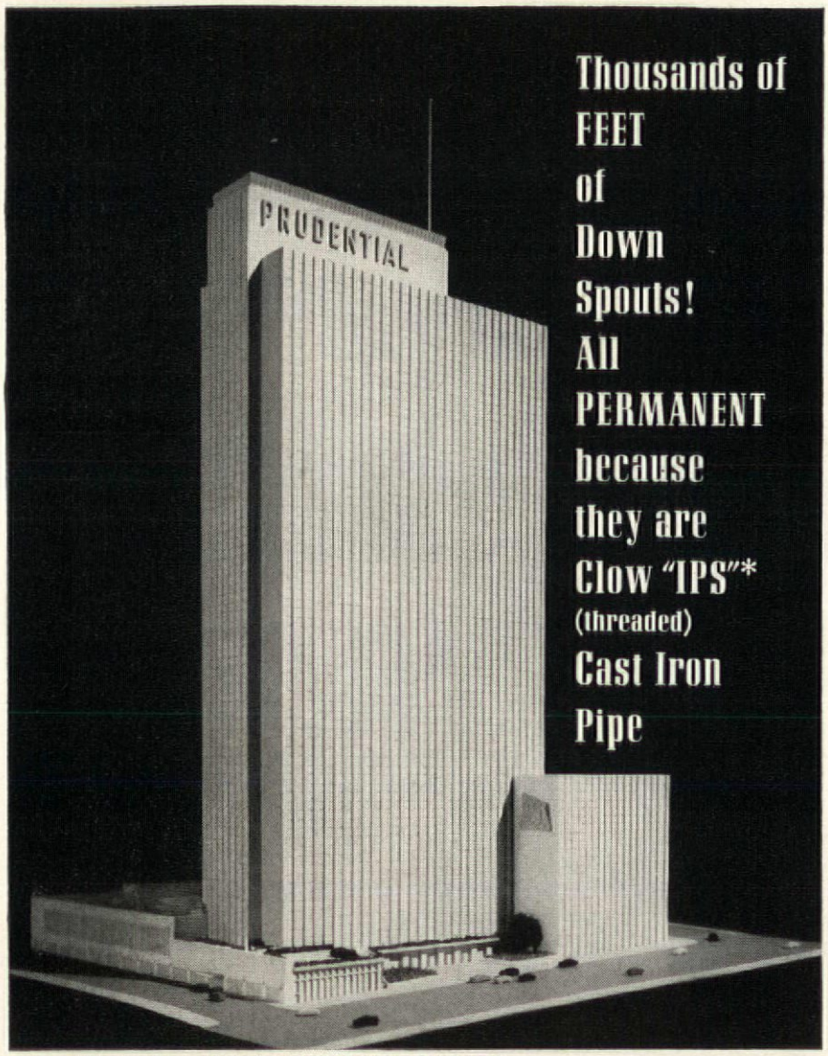
Marmet Aluminum Windows, Cat. 55-2. Marmet Corp., Wausau, Wis. 16 pp. 8½" x 11"

ELECTRICAL EQUIPMENT

"Concentrol" Motor Control Centers, Bul. 401. Continental Electrical Equipment Co., Box 1055, Cincinnati 1, Ohio. 8 pp. 8½" x 11"

Continental Low Voltage Switchgear, Bul. 200. Continental Electric Equipment Co., Box 1055, Cincinnati 1, Ohio. 8 pp. 8½" x 11"

Continental "Plug-Duct," Bul. 300. Continental Electric Equipment, Box 1055, Cincinnati 1, Ohio. 24 pp. 8½" x 11"



Thousands of FEET of Down Spouts! All PERMANENT because they are Clow "IPS"* (threaded) Cast Iron Pipe

PRUDENTIAL MID-AMERICA HOME OFFICE, CHICAGO
ARCHITECTS: NAESS & MURPHY • PLUMBING CONTRACTOR: M. J. CORBOY CORP.
GENERAL CONTRACTOR: GEORGE A. FULLER COMPANY.

Clow "IPS"* (threaded) Cast Iron Pipe is corrosion-proof, requires no replacement, no upkeep. Installation is fast, economical . . . permanent. In most instances it is specified for soil, waste and vent lines, and downspouts. Now in two new sizes—1½" and 2"—besides former 3" through 10" sizes.

JAMES B. CLOW & SONS

*Iron Pipe Size, O.D.

201-299 North Talman Avenue • Chicago 80, Illinois

WHOLESALERS OF PLUMBING AND HEATING SUPPLIES
Publishers of the Clow Bulletin

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Fireye Combustion Control System FJ-2. Combustion Control Div., Electronics Corp. of America, 718 Beacon St., Boston 15, Mass. 16 pp. 8½" x 11"

FIRE PROTECTION

Fireproofing with Perlite. Perlite Institute, 10 E. 40th St., New York 16, N.Y. 8 pp. 8½" x 11"

FLOORING

Designs for Better Floors. Johns-Manville, 22 E. 40th St., New York 16, N. Y. 12 pp. 8½" x 11". 10¢ per copy

HARDWARE

Townsend Tuff Tite Fasteners, Brochure TL 97. Townsend Co., New Brighton, Pa. 4 pp. 8½" x 11"

HEATING, VENTILATING AND AIR CONDITIONING

Air Conditioning an Entire Building with Individual Packaged Units. Philco Corp., Air Conditoning Div., Tioga and C Sts., Philadelphia 34, Pa. 20 pp. 8½" x 11"

Atmospheric Spray Cooling Towers, Bul. 312. Binks Mfg. Co., 3122 Carroll Ave., Chicago 12, Ill. 12 pp. 8½" x 11"

A New System of Continuous, Intensity Controlled Rapping for Cottrell Electrostatic Precipitators. Research-Cottrell, Inc., 405 Lexington Ave., New York 17, N.Y. 6 pp. 8½" x 11"

Oil Burner Controls—the AP Condensed Catalog. A-P Controls Corp., 2450 N. 32nd St., Milwaukee, Wis. 8 pp. fold-out. 8½" x 11"

Perfex Controls Catalogue. Perfex Corp., Advertising Dept., 500 W. Oklahoma Ave., Milwaukee 7, Wis. 30 pp. 8½" x 11"

Shaw Panel Baseboard Radiators. Shaw-Perkins Mfg. Co., Pittsburgh 19, Pa. 4 pp. 8½" x 11"

Squires Steam and Air Traps. C. E. Squires Co., 18502 Syracuse Ave., Cleveland 10, Ohio. 4 pp. 8½" x 11"

continued on p. 236

They're Called

THE DRAINS WITH THE *Elevator Top*

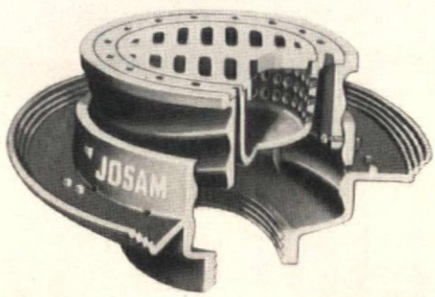
stops at any level to save time, labor, guesswork

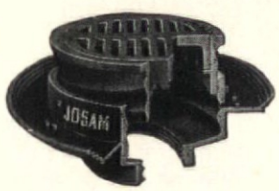
Josam

LEVELEZE

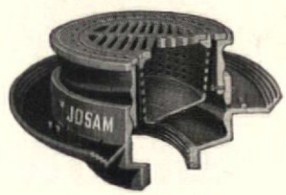
adjustable Top

FLOOR AND ROOF DRAINS

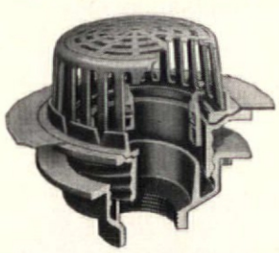




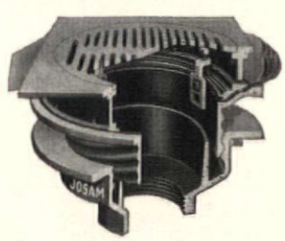
Josam Series No. 3610 Leveleze Floor Drain with rolled thread adjustable top and deep set tractor grate.



Josam Series No. 3740 Leveleze Non-Clog Triple Drainage Floor Drain with rolled thread adjustable top, sediment bucket and auxiliary drainage rim.



Series No. 4550 Leveleze Roof Drain with adjustable top permits raising or lowering the roof flange to meet the required insulation thickness even after roof is laid. Eliminates tearing out construction, disconnecting drains and other costly adjustments.



Josam Series No. 4580 Leveleze Roof Drain same as Series No. 4550 except with flat grate for promenade roof deck.

Many Other Types Available

- Josam LEVELEZE drains have the exclusive feature of an "adjustable top with rolled thread" that is completely detachable from the drain body and permits lowering or raising the top to meet the finished floor or roof level even after the drain body is set in construction. Ordinary drains require tearing out construction, disconnecting pipe, making expensive repairs if the drain is set too high or too low. With Josam LEVELEZE drains, the adjustment is simple . . . easy . . . quick, because they can be raised or lowered to meet the required level. They save hours of time and labor wherever used.

Get complete information on this exclusive and unusual line of drains by mailing coupon below today!

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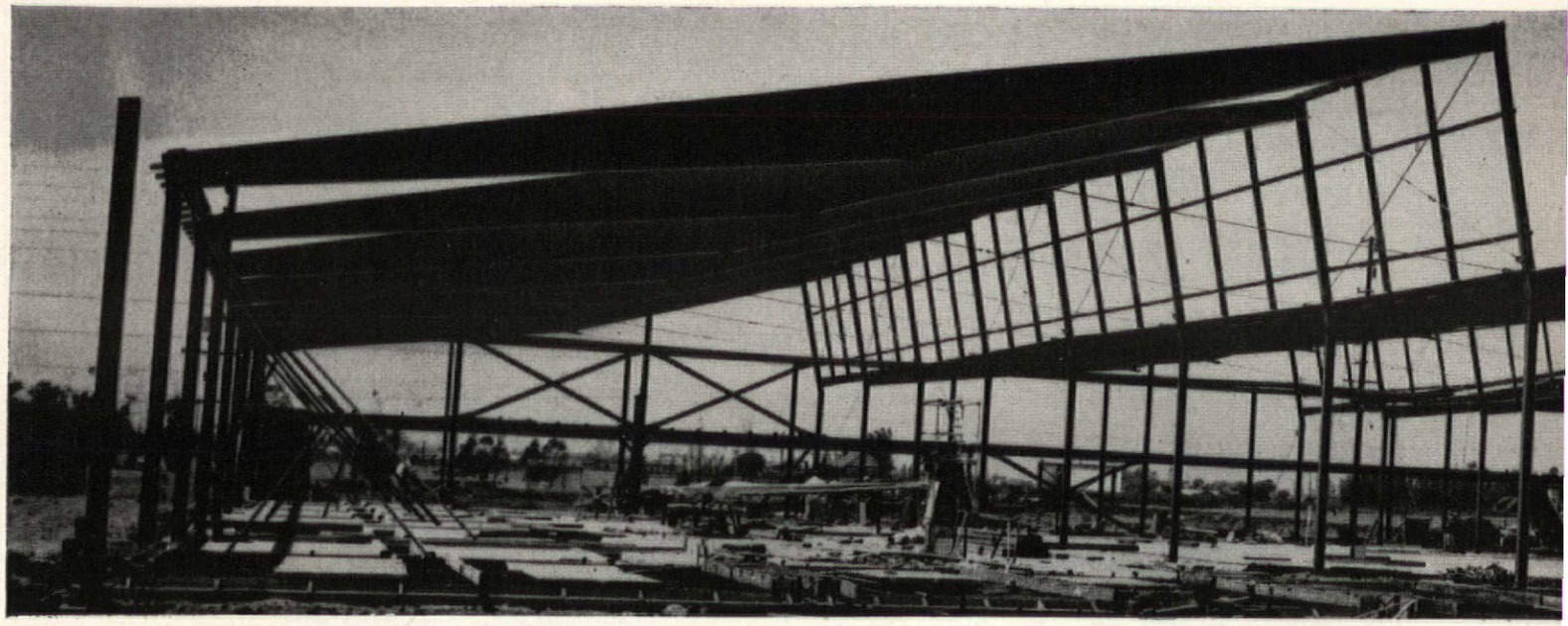


"Hurry-up construction"

at lowest cost calls for USS Structural Steel

The company: **Minneapolis-Honeywell Regulator Co., Los Angeles.**

The problem: **Not enough space (frequently heard nowadays). Another building needed in a hurry.**

The answer: **A new, expandable machine shop with plenty of natural light, a shop that's economical and easy to maintain.**

● The structural design chosen consisted of a series of 30′ x 60′ bays, the roof framing of which was composed of tapered-steel girders and open-web joists. Using this economical design coupled with the use of USS Structural Steel, the builders were able to obtain 30′ x 60′ bays at very little more than 20′ x 40′ bays would have cost had some other design or material been used. Among others considered, but eliminated due to prohibitive cost, were welded north-light rigid-frame gable bents, 60′ steel trusses, precast-concrete bents, and prestressed concrete beams.

U.S. Steel's Consolidated-Western Division of Los Angeles contracted to have the steel frame ready for installation of walls and roofs within 43 working days after receipt of approved blueprints. This included making shop detail drawings, shop fabrication, painting and erecting the steel. The frame was ready four days ahead of schedule.

Structural Steel is the most economical of load-carrying materials. Yet, it is the strongest. It will withstand more abuse than other structural materials—effectively resisting tension, torsion, compression and shear. Enclosed in buildings, it will last indefinitely—requiring no maintenance. Equally adaptable to riveting, welding, or bolting, Structural Steel can be erected in any weather in which men can work. And since steel members are fabricated indoors, weather can have no effect on the quality of workmanship.

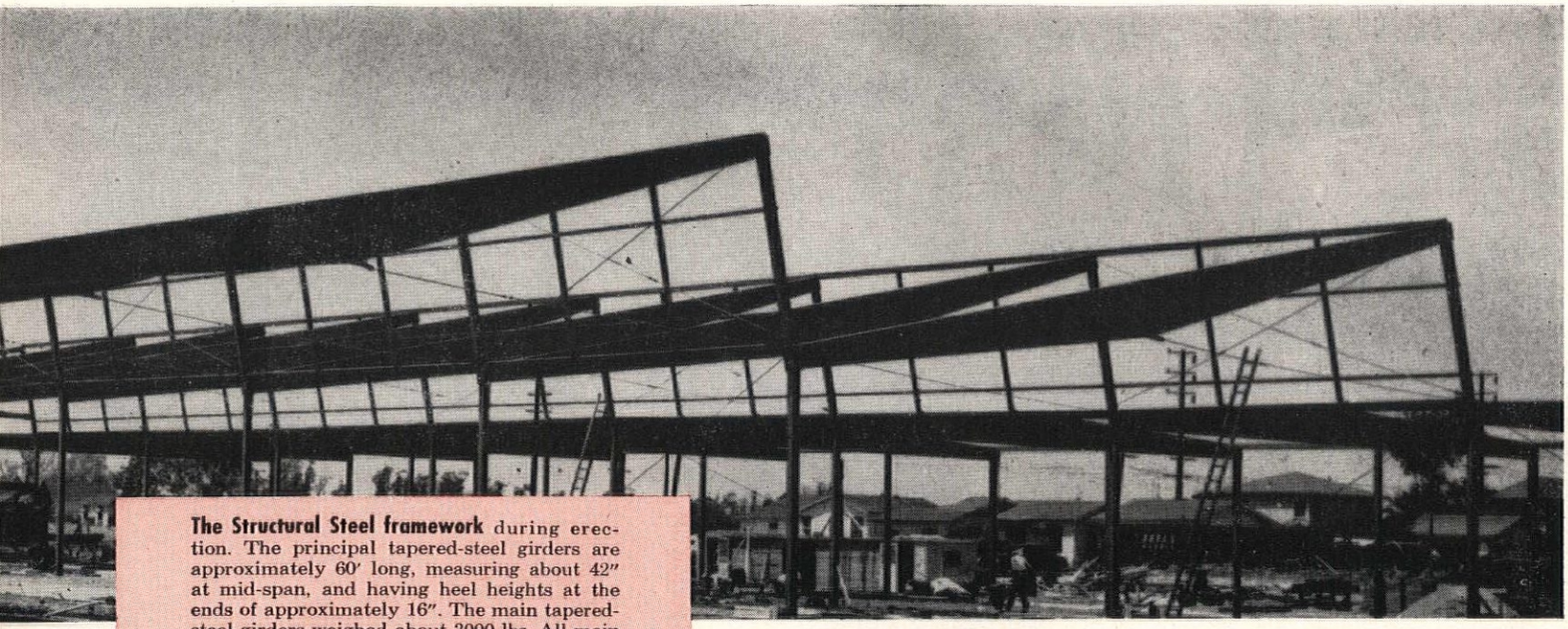
For further information on construction with steel, write to the United States Steel Corporation, 525 William Penn Place, Room 4590, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

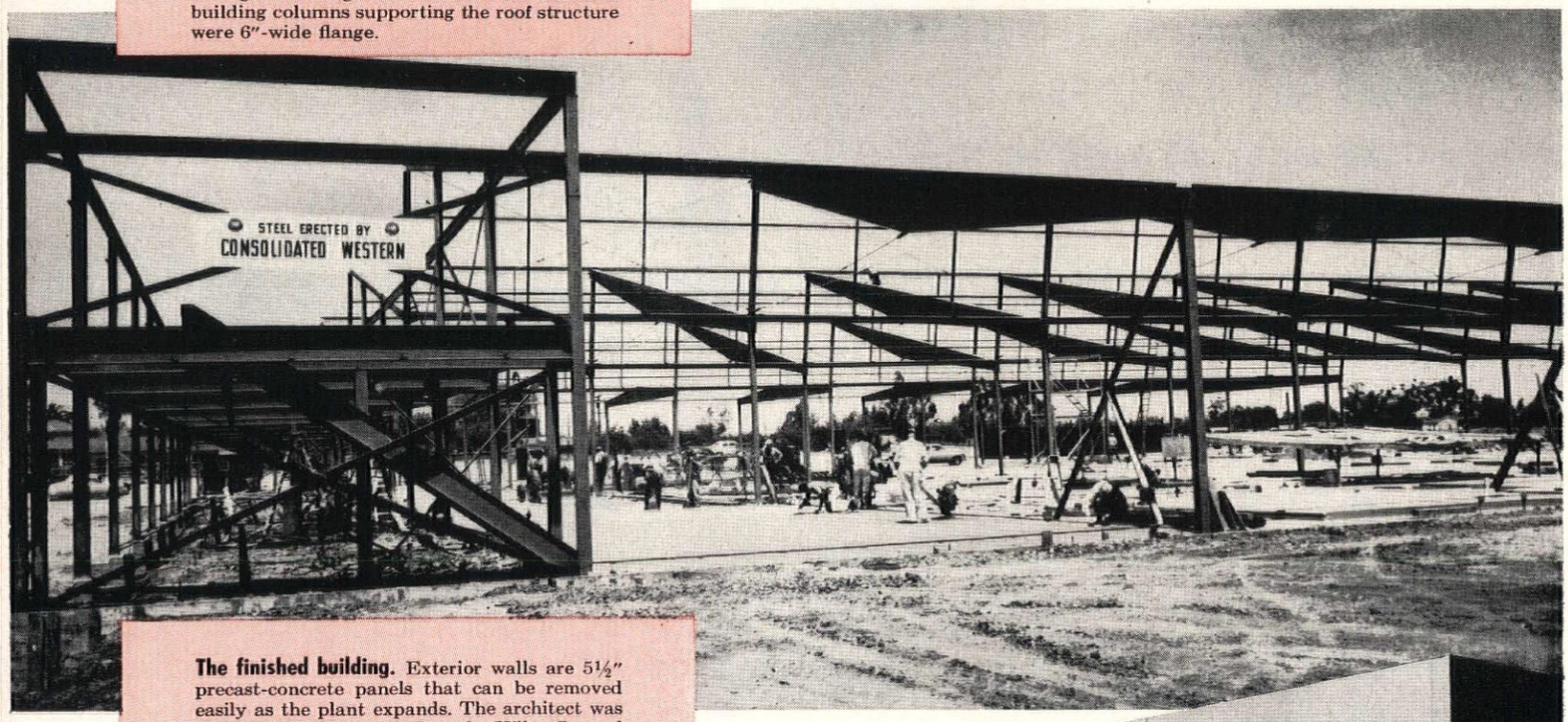
USS STRUCTURAL STEEL

USS TRADE MARK

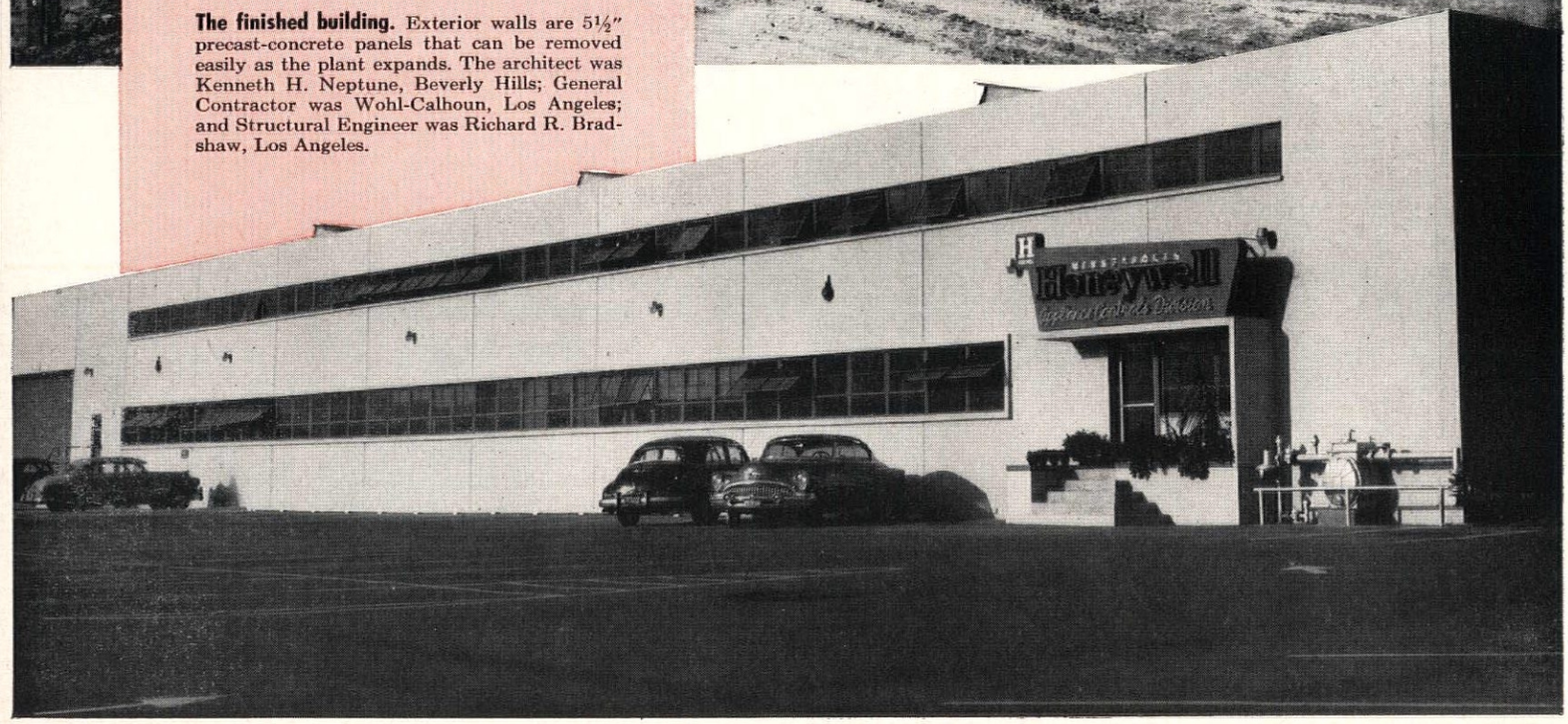
UNITED STATES STEEL



The Structural Steel framework during erection. The principal tapered-steel girders are approximately 60′ long, measuring about 42″ at mid-span, and having heel heights at the ends of approximately 16″. The main tapered-steel girders weighed about 3000 lbs. All main building columns supporting the roof structure were 6″-wide flange.

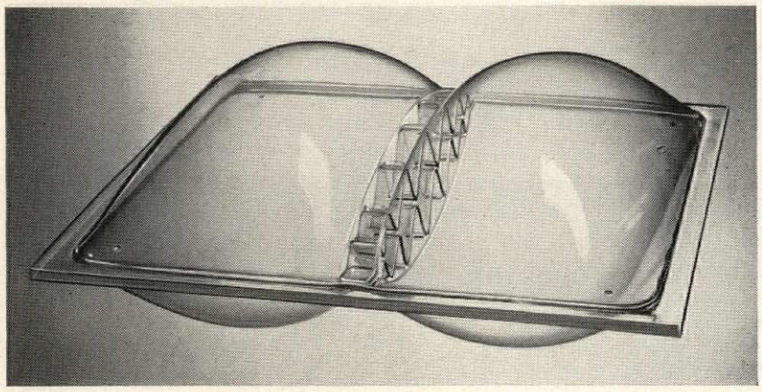


The finished building. Exterior walls are 5½″ precast-concrete panels that can be removed easily as the plant expands. The architect was Kenneth H. Neptune, Beverly Hills; General Contractor was Wohl-Calhoun, Los Angeles; and Structural Engineer was Richard R. Bradshaw, Los Angeles.



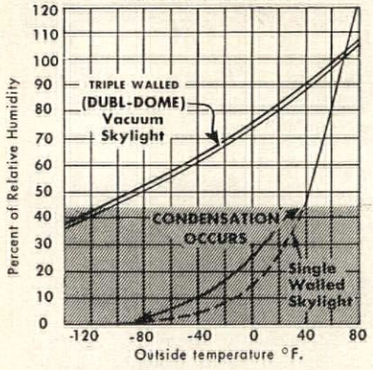
BETTCHER DUBL-DOME PLEXIGLAS

SKYLIGHT



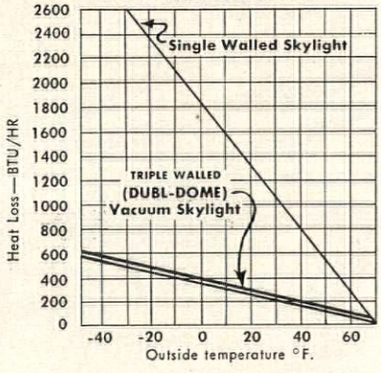
- **STOPS CONDENSATION COMPLETELY**
- **STOPS 80% OF HEAT LOSS***
- **YET COSTS ONLY 25% MORE**

CONDENSATION CHART

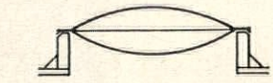


Calculated allowable inside relative humidity based on 70°F. inside temperature. (Shaded area indicates usual maximum range of inside humidity (45%).

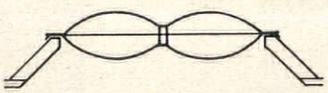
HEAT LOSS CHART



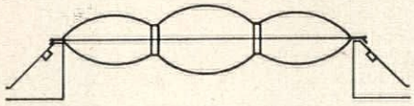
Calculated heat loss curves for 4′x4′ skylight. Based on standard ASH & VE design conditions of still air inside and 15 MPH wind outside. Inside temperature at 70°F.



Single Dome Style sizes include 2′x2′, 2′x3′, 2′x4′. Curb mounting shown here is standard 2′x6′ wood construction.



Twin dome style sizes include 3′x3′, 3′x4′, 4′x4′. Curb mounting shown here is special slant type construction. For detail drawings of methods of construction write manufacturer.



Triple dome style sizes include 3′x5′, 3′x6′, 4′x5′, 4′x6′. Curb mounting shown here is standard cement construction. Any of the above domes can be mounted on any or all types of curbs indicated in these drawings. For details of construction drawings write the manufacturer.

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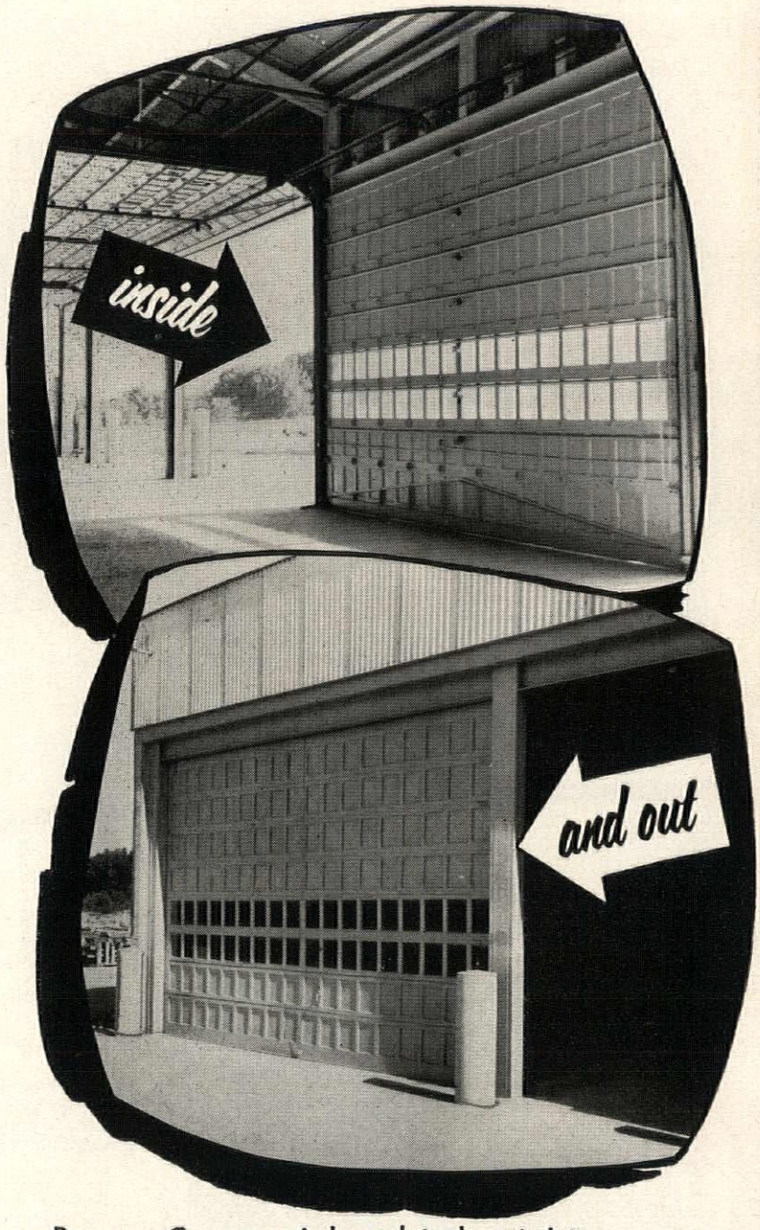

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Continued from p. 230

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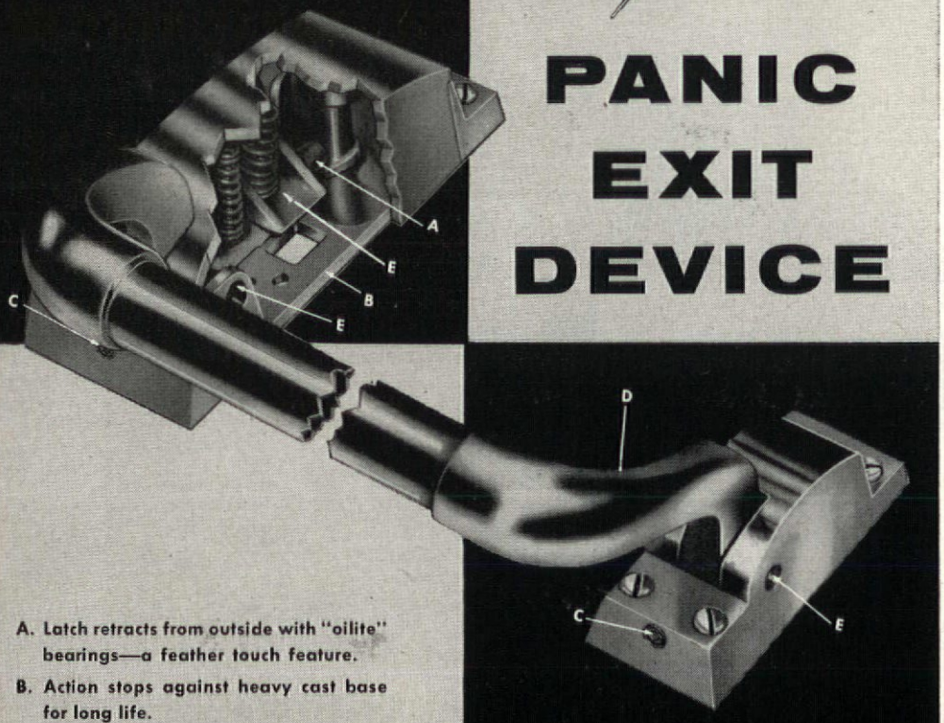

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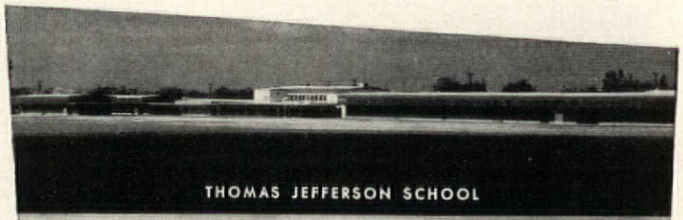

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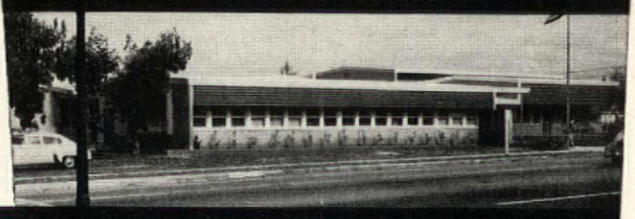

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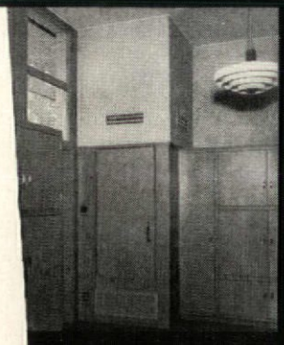
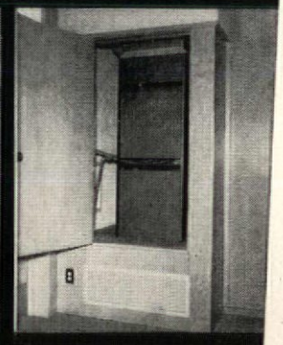


Exterior of corner cabinet containing room conditioner. The two warm air outlets are shown above the woodwork, air return is below access door.



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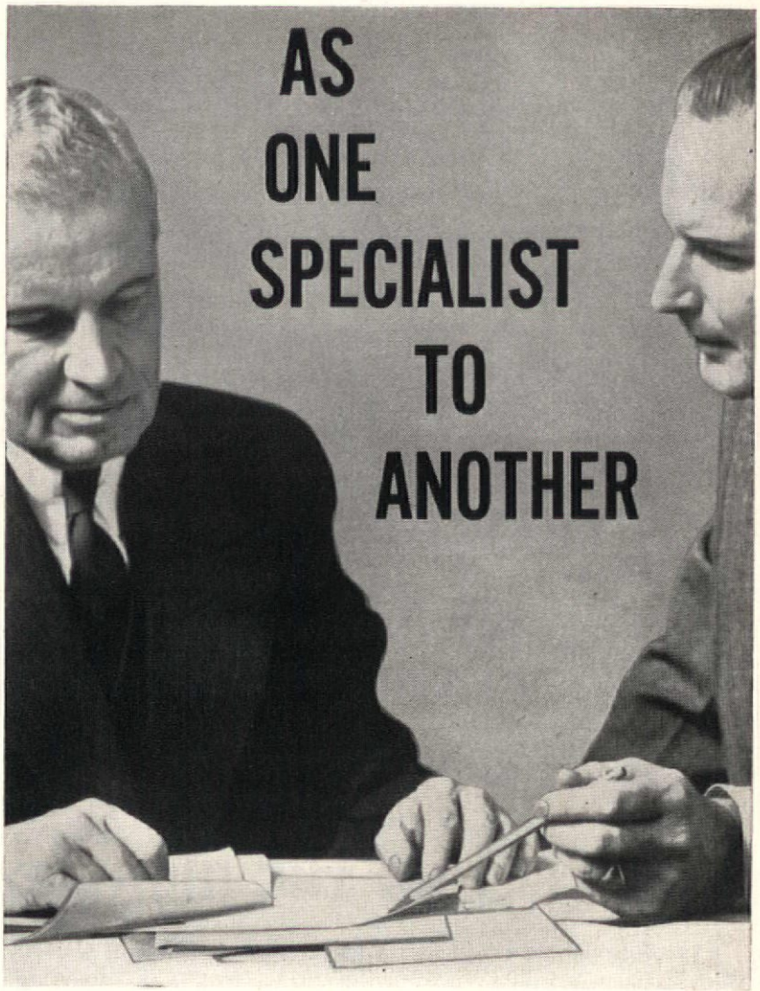

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Armstrong No. S-105 Chemical-Set Underlayment Cement may be troweled to a thin "featheredge" in leveling worn or damaged areas of concrete subfloors. This will frequently eliminate the need for complete resurfacing of an old subfloor.

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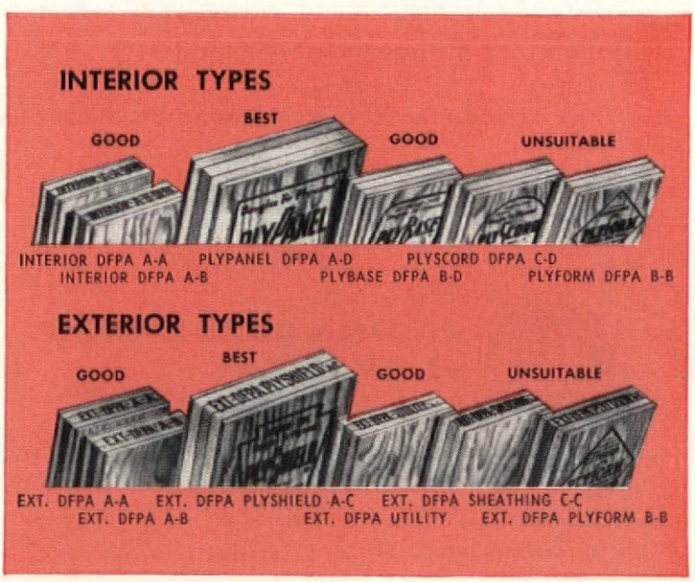
SELECTING THE RIGHT TYPE OF UNDERLAYMENT

Resilient flooring materials all tend to mold themselves somewhat to irregularities of the surface over which they are installed. This tendency, in addition to the more or less severe seasonal expansion and contraction of subfloors, makes it extremely important that architects be familiar with the right underlayment for various conditions and that they insist upon its correct installation. Otherwise, the resilient finish floor may lose some of its attractive appearance because of an uneven subfloor or even be split by subfloor movement.

There are two main types of subfloors to be considered: concrete (or other monolithic floors, such as terrazzo, ceramic tile, or steel) and wood—and two main types of underlayments: board and mastic. If the subfloor is concrete, and an underlayment is needed, a mastic-type compound should be used. Wooden subfloors call for either board or mastic-type underlayments, depending on their type and condition. Mastic-type underlayments are generally used to *level* wood floors—not to smooth them.



Mastic-Type Underlayments. Mastic underlayments are of two kinds—those which use a binder such as asphalt or latex in the mix and those which consist simply of a powdered mixture such as cement, gypsum, and sand, to which only water is added. For some installations, either type will be satisfactory. Generally, however, only the binder-type mastics are suitable for the thin applications needed for underlayment work. The powdery floor fills all too often break down under traffic when applied in thin coats. Of the binder-type mastics, the latex type has proved superior for application in "skin" coats, of ⅛" or less thickness. In heavier applications the asphalt type of mastic is usually preferred for its lower cost.

Armstrong Flormastic* is an asphaltic compound which, when mixed with Lumnite cement and aggregates, is both inexpensive and satisfactory under any normal conditions, including installations over radiant-heated subfloors. However, Flormastic should not be used when the resilient flooring is to be installed with No. S-104 Chemical-Set Waterproof Cement.

Joint spacing of approximately 1/16" is left between sheets of hardboard underlayment to allow for slight expansion and contraction with varying moisture conditions. The hardboard sheets should be laid with joints staggered, ashlar fashion.

Hardboard or plywood underlayment should be firmly nailed to the underfloor with coated or ferrule-ring nails. Nails must be placed not over six inches on center in all directions and at all edges and driven flush with the underlayment.

Armstrong No. S-105 Chemical-Set Underlayment Cement is recommended for use with this adhesive and for thin applications and "featheredging."

It is important to remember that the subfloor must be free from surface treatments such as paint, oil, and varnish before any mastic-type underlayment is applied.

Board-Type Underlayments. The basic choice here is between hardboard and plywood. Most architects have found it satisfactory to specify hardboard on remodeling work and plywood on new construction. The main reason for this is that the thinner hardboard type of underlayment avoids excessive building up of old subfloors. In new construction, on the other hand, it is often desirable to build up subfloors.

Hardboard. Hardboards such as Armstrong Temboard® Underlayment which have one smooth and one "wire" side are recommended in Armstrong specifications. This type of hardboard has been in use for over 25 years and has proved to be most satisfactory. Tempered hardboards should never be specified as underlayments, because they tend to buckle when subjected to moisture, are difficult to nail, and are more expensive than the recommended types. Those having two "smooth" sides do not provide so good a surface for adhesion as Temboard Underlayment.

Plywood. This material has been used satisfactorily as an underlayment for many years. The general term "plywood," however, should always be qualified in underlayment specifications. Only eight of the twelve types of plywood available are suitable as underlayment. Among interior plywoods, grades such as AD, AB, AA, and BD are recommended, with AD preferred because it provides one perfect face, yet is economical. Grades CE and BB should not be used.

Among exterior plywoods, grades AA, AB, AC, and BC are recommended, with AC preferred on balance between cost and performance. CC and BB should not be used. A 3/8" or greater thickness should be used in all cases. (See chart). As a general rule, interior plywoods are used because of lower cost. Exterior plywoods are recommended wherever excessive water spillage occurs, such as around soda fountains, at the entrances of public buildings, and on counter tops.

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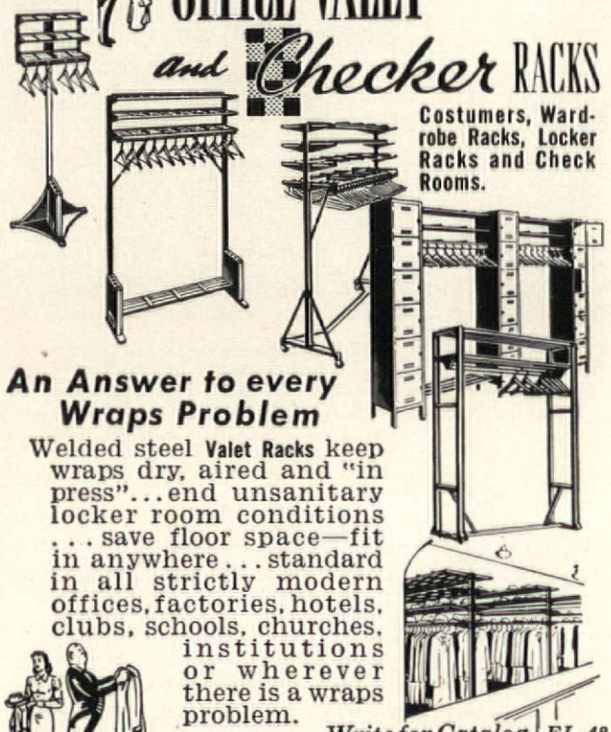

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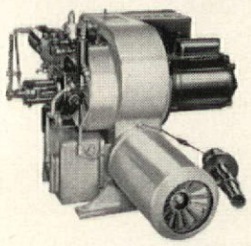

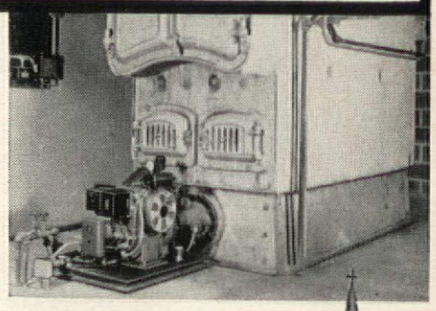

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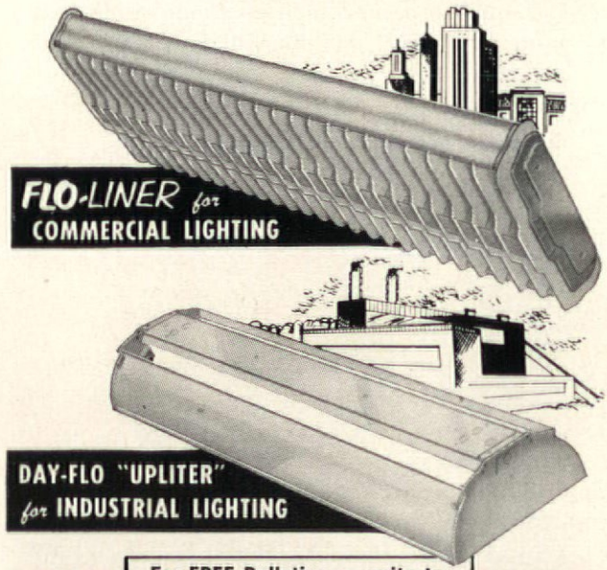

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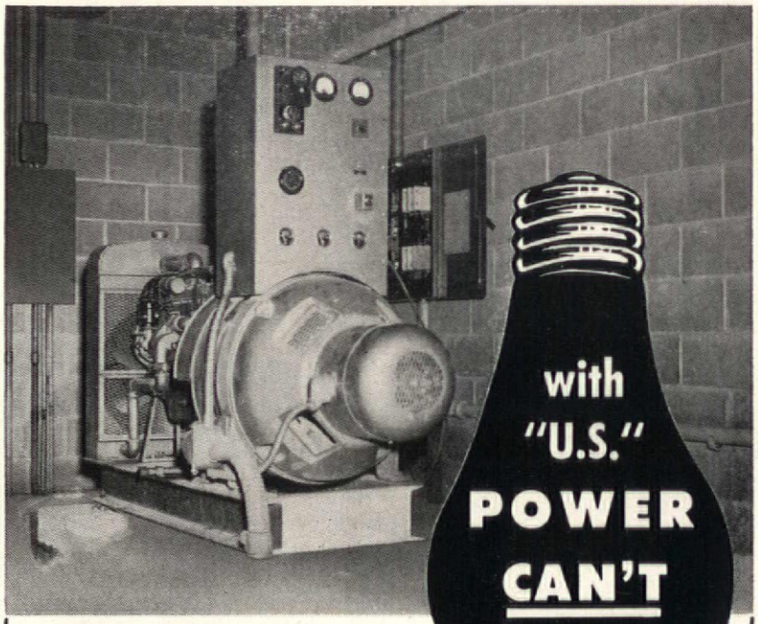

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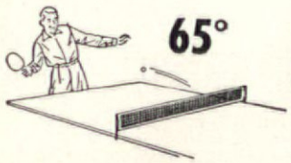

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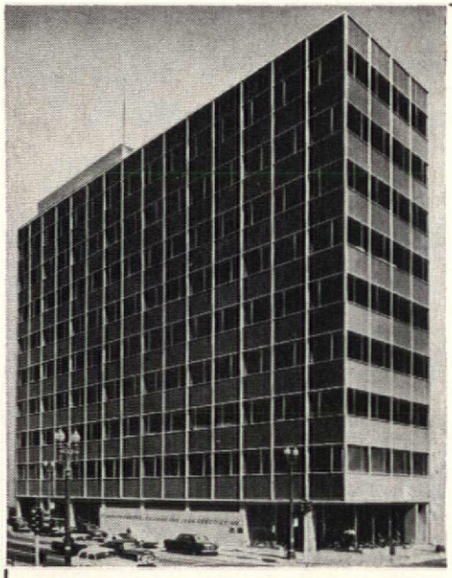

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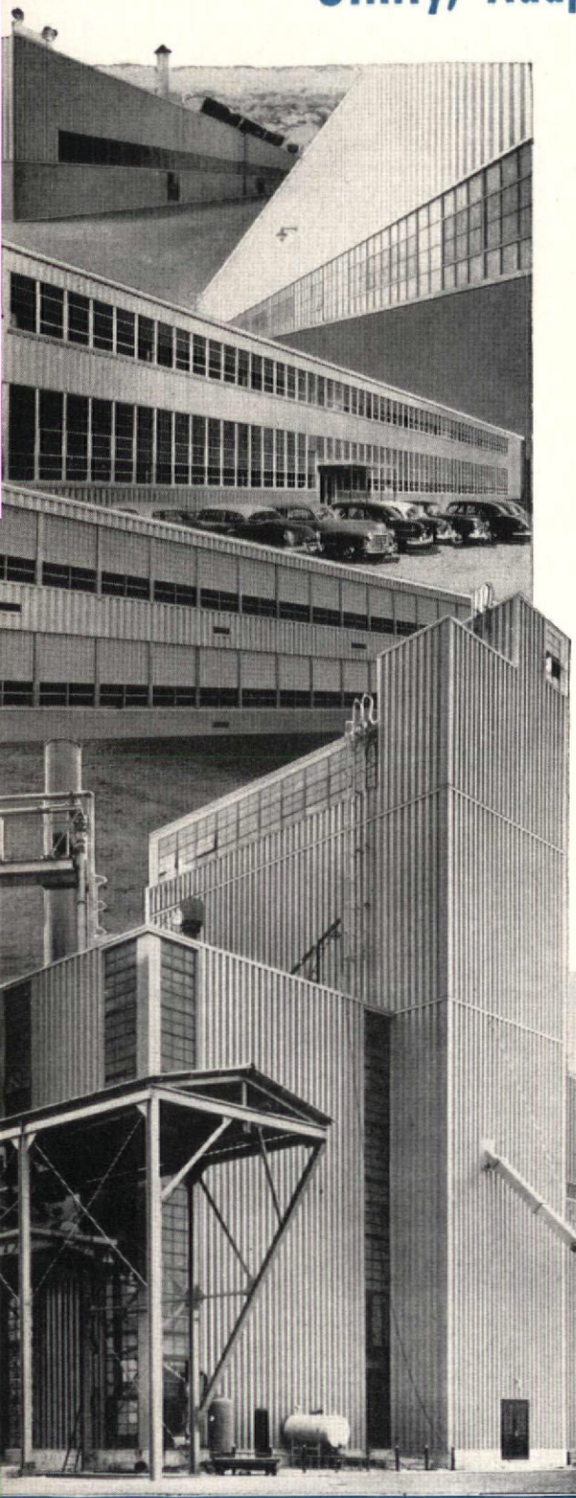

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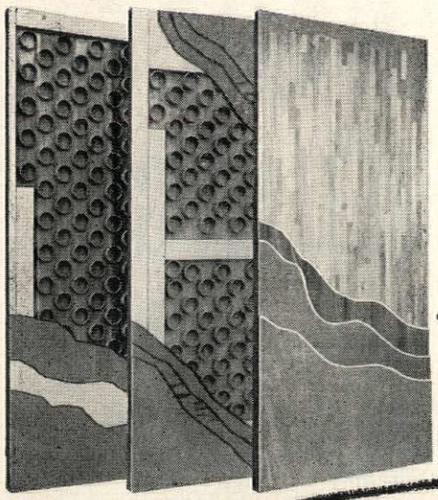

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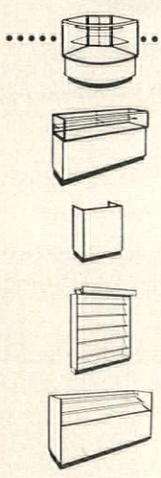

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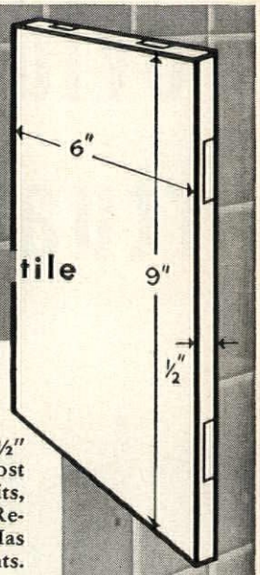

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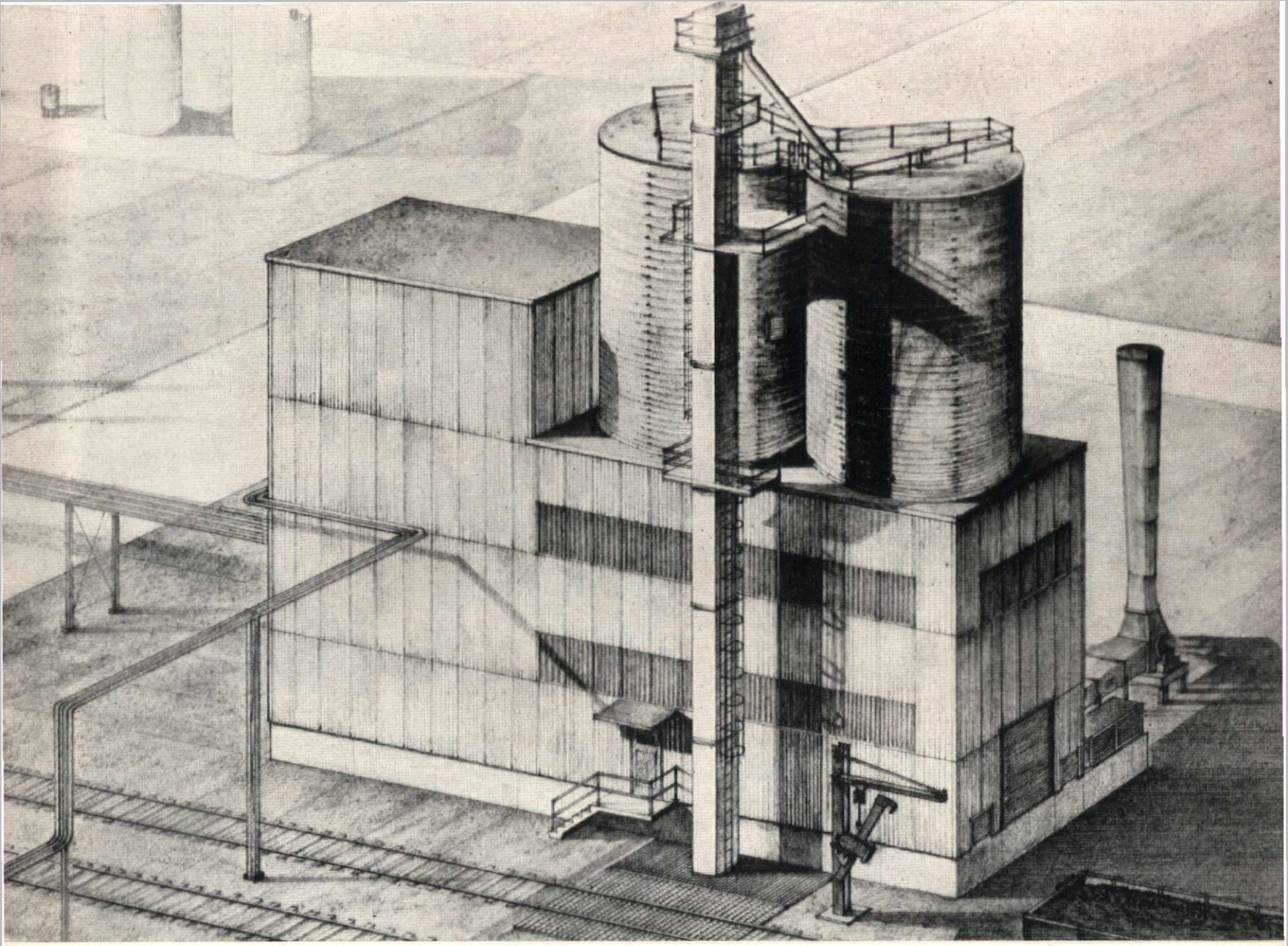

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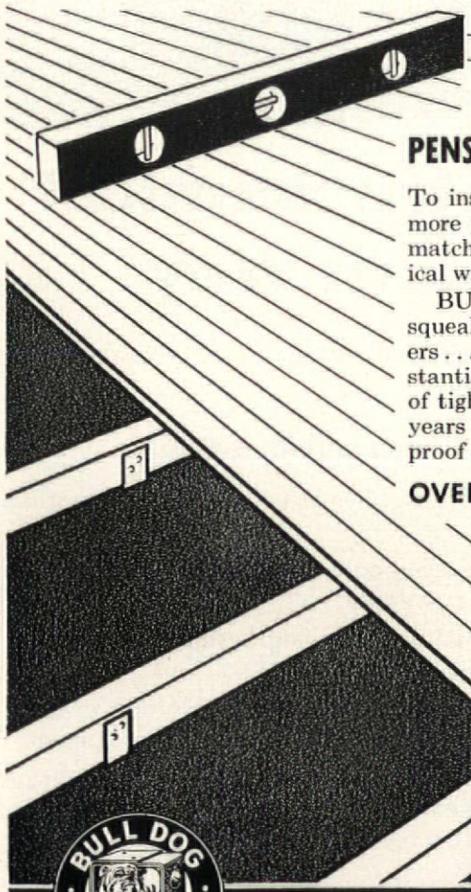

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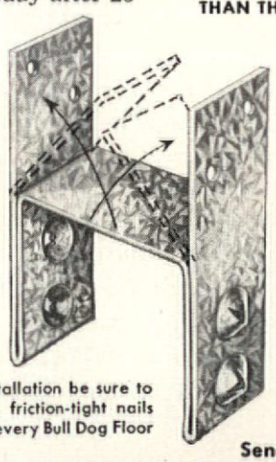

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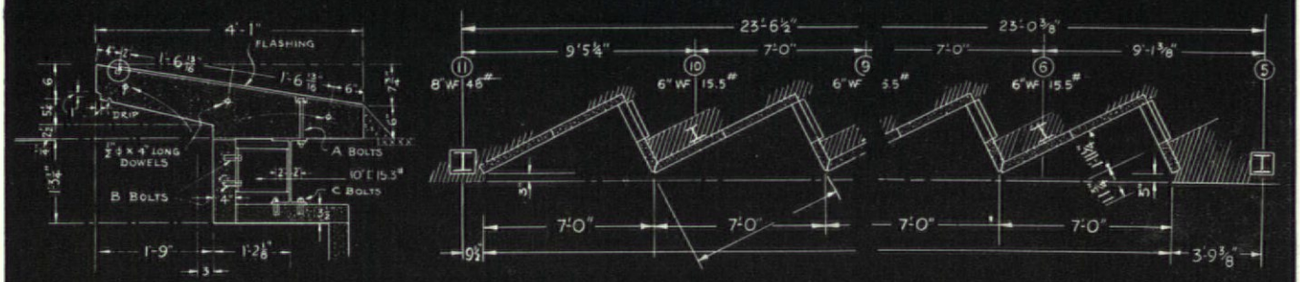

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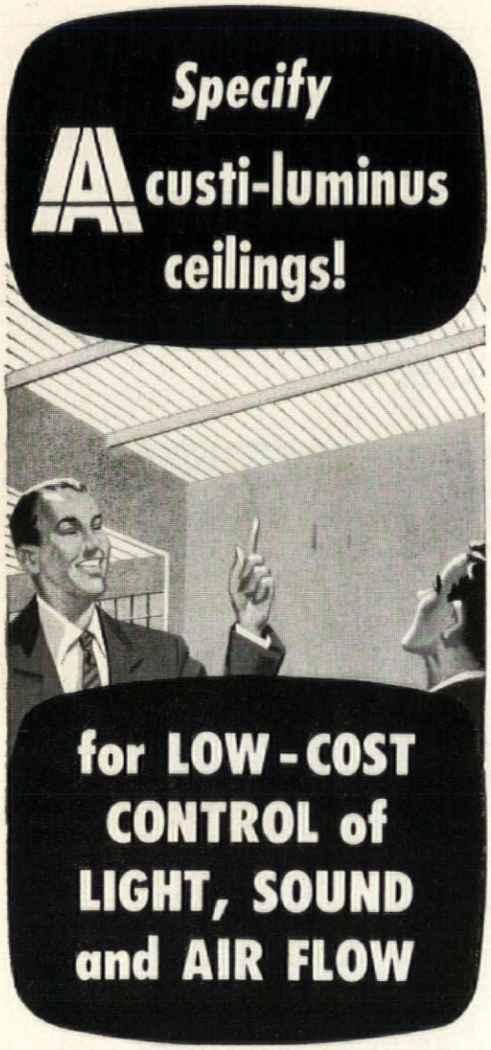

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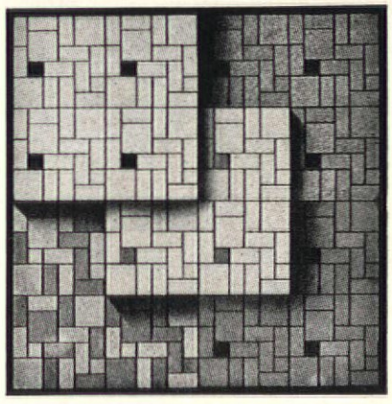

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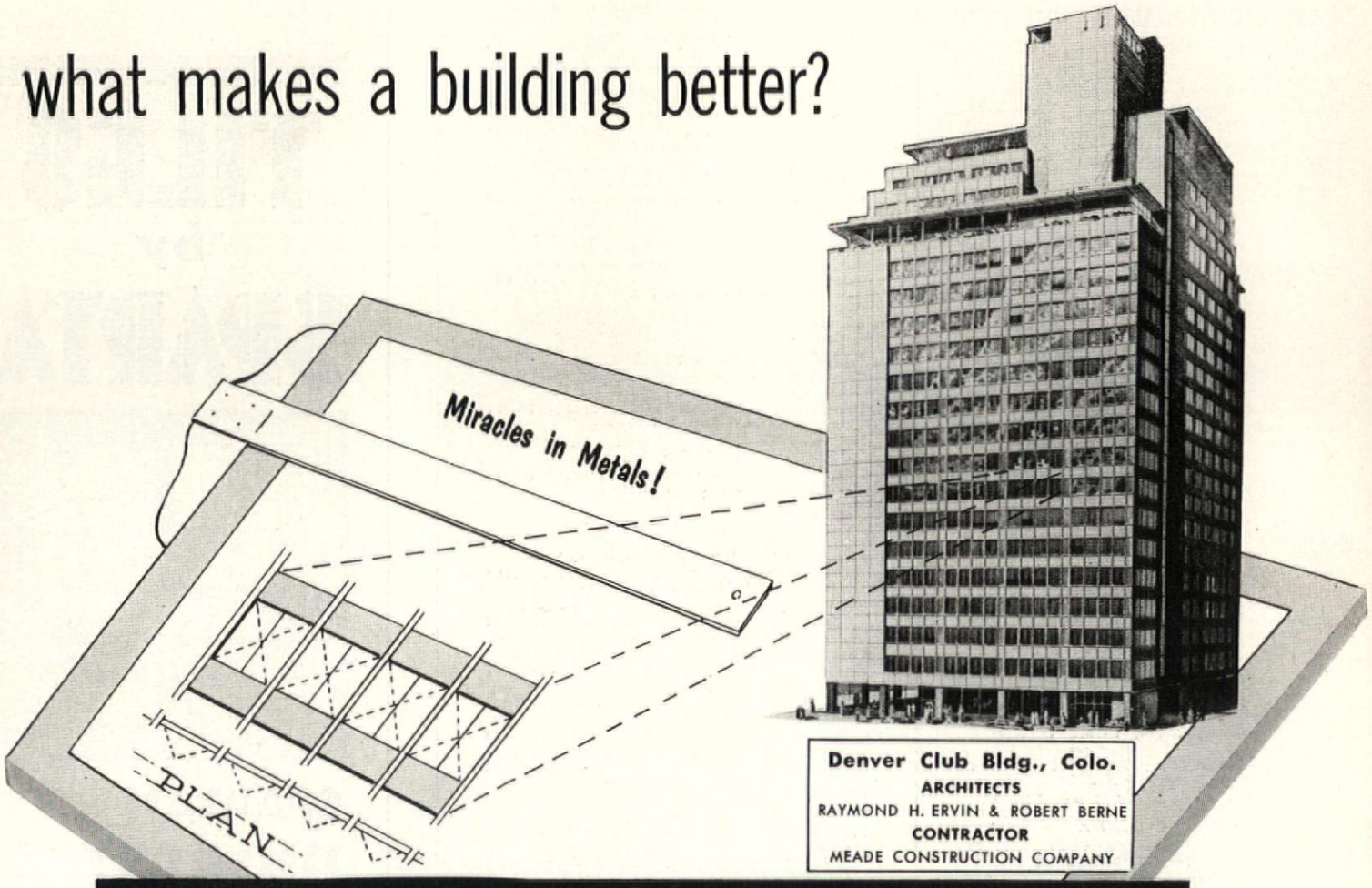

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PITTSBURGH, PENNSYLVANIA

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General Contractor: Rose & Fisher, Pittsburgh, Pa.
Plumbing Contractor: Weldon & Kelly, Pittsburgh, Pa.
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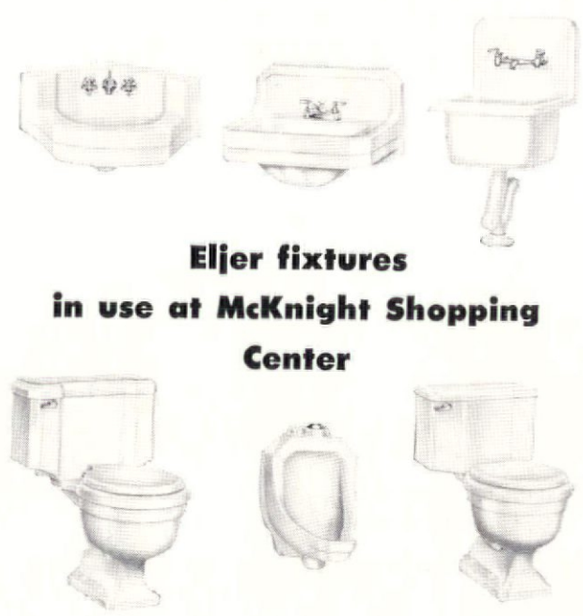

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